SCIENCE AND INDUSTRY
JUL 14 1943
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MANUFACTURERS RECORD

STATES

July
1943

WAR BONDS

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MACKLIN
GRINDING WHEELS

THAT WHEEL YOU RECOMMENDED HAS ELIMINATED OUR BOTTLE-NECK AND NOW OUR PRODUCTION IS REALLY GOING TO TOWN
THATS MY JOB "PROTECT YOUR PRODUCTION"
MACKLIN FIELD ENGINEER

Macklin Grinding Wheels are made in all sizes and shapes for every type of grinding job. An experienced Macklin Field Engineer is available at all times for the asking—no obligation.

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Manufacturers of GRINDING WHEELS — JACKSON, MICHIGAN, U. S. A.

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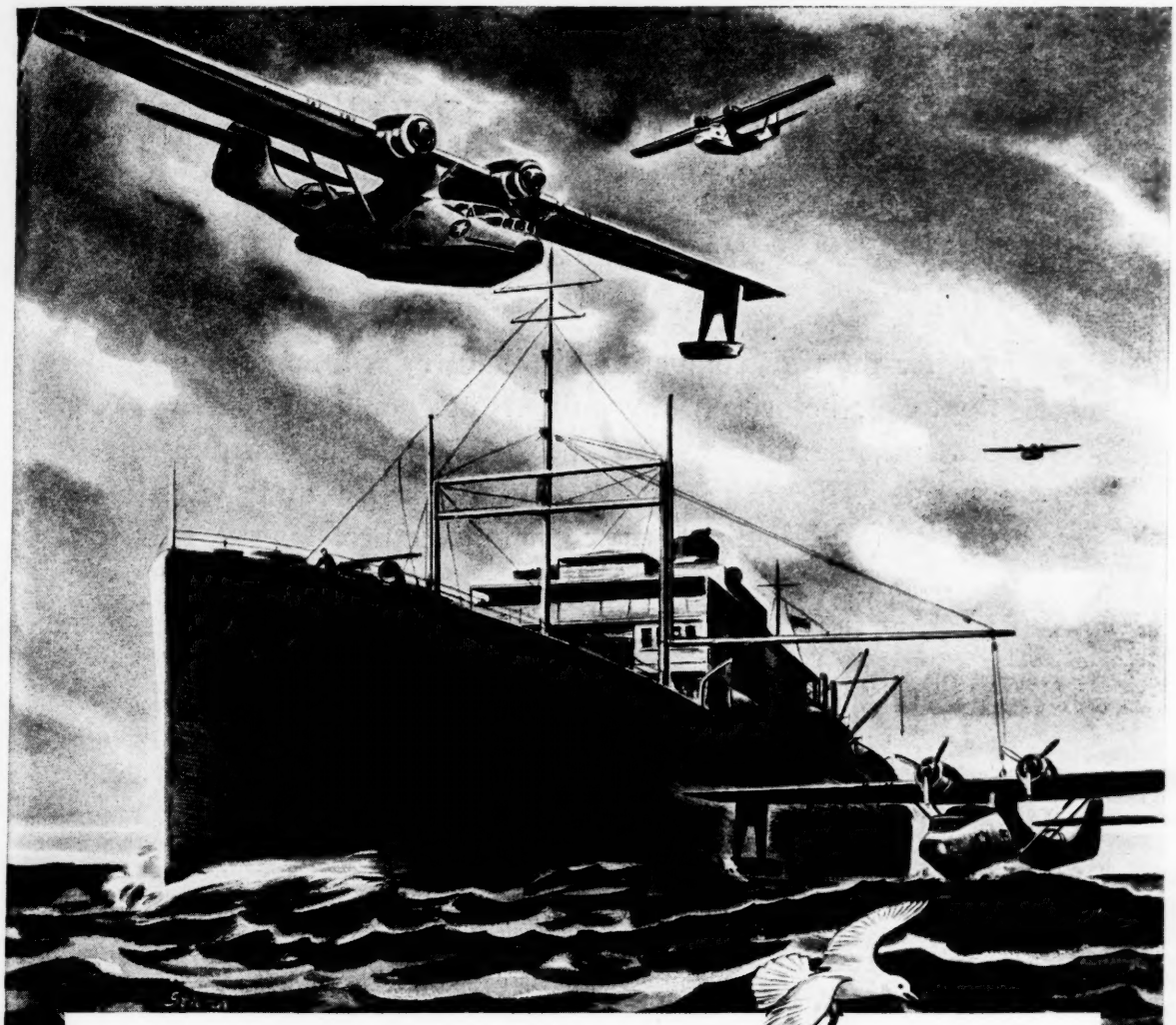

Eyes and Ears of the Fleet

You hear more of other craft than of Seaplane Tenders — but from Pearl Harbor on they've been in there . . . patrolling . . . listening . . . *fighting*. A Jap fleet moves toward the Solomons. Long before it is within range of land-based aircraft, Seaplanes from a Seaplane Tender have spotted it. From then on the officers of America's fighting forces know every move of the enemy, and what to do about it, for example, the Bismarck Sea!

To provide both propulsion and auxiliary Diesel engines for these and other important warcraft of the U. S. Navy is the assigned task of Fairbanks-Morse. It is a task of which we are proud. We feel that nothing less than our level best is good enough.

Fairbanks-Morse & Co., 600 South Michigan Avenue, Chicago, Illinois.

FAIRBANKS, MORSE & CO.

THE RETURN OF COMPETITION

After the war, competition in industry will be keener than ever before. Many millions of people who have been mobilized for war will be turned back into normal pursuits. New industries, new processes and new markets will dominate the economic picture.

The manufacturer who can meet his competitors' cost will be the one to survive. The low cost industries will be the ones to profit.

In this connection, remember that—

During the depression years of the early and middle thirties, industry expanded at a greater rate in the Seaboard Southeast than anywhere else in the Country.

The reason—

Operating factors are favorable and hence manufacturing costs are low.

When you plan on plant expansion, let us submit facts and figures on locations in the Seaboard Southeast. The inquiry will cost you nothing. It may be worth a lot to you.

INDUSTRIAL DEPARTMENT

SEABOARD

AIR LINE RAILWAY

WARREN T. WHITE
General Industrial Agent
Norfolk, Va.

MANUFACTURERS RECORD

Established 1882

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The illustration on this month's cover was specially designed and drawn for the MANUFACTURERS RECORD *by H. Steffan of Baltimore, Md.*

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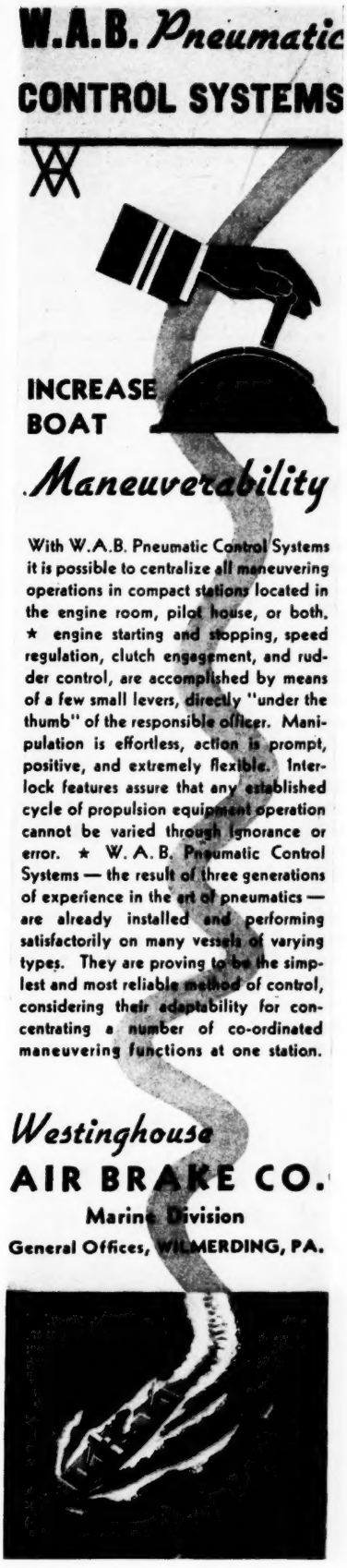

W.A.B. Pneumatic
CONTROL SYSTEMS
INCREASE
BOAT
Maneuverability
With W.A.B. Pneumatic Control Systems it is possible to centralize all maneuvering operations in compact stations located in the engine room, pilot house, or both. ★ engine starting and stopping, speed regulation, clutch engagement, and rudder control, are accomplished by means of a few small levers, directly "under the thumb" of the responsible officer. Manipulation is effortless, action is prompt, positive, and extremely flexible. Interlock features assure that any established cycle of propulsion equipment operation cannot be varied through ignorance or error. ★ W. A. B. Pneumatic Control Systems — the result of three generations of experience in the art of pneumatics — are already installed and performing satisfactorily on many vessels of varying types. They are proving to be the simplest and most reliable method of control, considering their adaptability for concentrating a number of co-ordinated maneuvering functions at one station.
Westinghouse
AIR BRAKE CO.
Marine Division
General Offices, WILMERDING, PA.

"IN THE NAME OF OUR GOD, WILL WE SET UP OUR BANNERS"

ROLL OF HONOR *for* SOUTHERN INDUSTRY

The war production record of manufacturing plants in the Southern states is the answer to the stigmatic statements from Washington regarding the South as "the Nation's economic problem #1."

A patriotic American fervor characterizes the South's war effort where 93% of the people are native-born and where a large proportion of young men and women in the military service are stationed in camps and schools.

Here, in a region once predominately agricultural, Army and Navy "E" Award flags and Maritime Commission "M" flags are going up one after another from Maryland to Texas.

Our September 1943 issue will feature a Roll of Honor in appropriate color settings and the names of the plants so honored.

By virtue of their geographic location, and with shipping outlets along the Atlantic and Gulf Coasts, these plants will unquestionably be called upon for a large part of post-war production for reconstruction.

Nations affected by the war will look to this Nation to supply much that will have been destroyed.

Col. John Callan O'Laughlin, Editor of the ARMY AND NAVY JOURNAL, on General Pershing's staff in the last war, will contribute the guest editorial for that issue.

★

MANUFACTURERS RECORD
BALTIMORE 3, MD.

Timely Comment

Our guest editorial this month is by a man who lived more than a century and a half ago and who in collaboration with his associates wrote the preface to the greatest story the world has ever known—the history of the United States of America. When entirely too many of us today have adopted as our slogan "Let George do it" the fact that our forefathers made our nation possible by refusing to let George do it should be a tonic and stimulant to our patriotism.

The Declaration of Independence has been the hope of the oppressed throughout the world for more than a century and three-quarters. Today the America that we love should remember it with reverence and reread it with care. It is the guiding star that directs us.

When it was founding the basis for its power the Nazi brain trust made its appeal on the theory that a lie, repeated often enough, would be accepted as truth by unthinking people. This theory succeeded in Germany. It is now being exploded by allied bombs. This theory has succeeded in some organized American labor organizations. The dupes, the dunces, the suppliers of the income have been mislead by lies based on half truths that make a man who honestly thinks shudder in shame for the duplicity of his fellow men on one hand and pity the fellow men who fall into the category made famous by P. T. Barnum when he said "There is one born every minute."

Equal justice for all and special privilege for none. Congress now, once again recognizes that democratic principle. It would reassure every man and woman in the United States if they knew that the President and the electoral offcasts and pettyfogging politicians that clutter up federal administration would awake and listen to the unmistakable rumble of the voice of the people.

Can Frankenstein destroy the monster that he has created? If he does not do so it will be destroyed by our enemies, or if we are fortunate and determined we will destroy it ourselves in time to remain the free people that our forefathers hoped we would be.

Who are making the sacrifices in order to enable us and our allied nations to survive and conquer?

The Soldiers
The Sailors
The Marines
The Coast Guard
The Taxpayers
The Salaried Men
The Professional Men
The Small Business Men

Isn't it about time that a proper share of na-

tional responsibility be brought home to
The Industrial Worker
The One Crop Farmer
The Coal Miner
The Lobby Ridden Politician
The Leader of Organized Labor

Frankenstein has the power to destroy his monster at will.

It seems that every loyal New Dealer—but wait a minute who are the loyal New Dealers and who are those that have been bought?—is now busy using the interior of his cranium as a rattling around place for Grecian and Roman and even Rooseveltian dried peas that are supposed to be ideas that will solve the post war problem. They should remember that Mr. Churchill, Mr. Stalin and General Chiang, not to mention his charming wife, whose nations have carried the major portion of the burden of the war thus far have their craniums filled with grey matter.

Years ago, when exposed to the study of geometry, we learned that the whole is greater than any one of its parts.

Some of our public servants, if they wish to remain public servants, should base some of their thinking on truths that they learned in their youth. The whole is greater than any one of its parts.

Years ago in a debarkation camp in France we saw a "battle royal" between a number of negro soldiers that was staged apparently for the edification and entertainment of all concerned. There were seven men in the ring. Six of them weighed about 150 pounds. The other man weighed well over 200 pounds. In order to equalize this exhibition of punch and duck the big man had one hand tied behind his back.

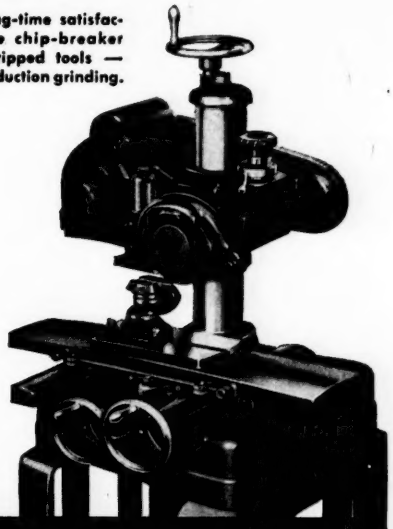
What happened when the fun (?) started? Of course all of the little men went after the big man who was defenseless; then they started on each other until there was only one survivor. The big man was knocked out of the picture because he was shackled and the little fellows fought it out among themselves for the spoils.

Some of us may be able to draw a comparison between government as expressed by the Wagner law and the referee who decided that the big man's one hand should be strapped to his side. We might also be able to draw a comparison between the present action of union labor leaders toward each other and the finish of the fight between the other little men.

The Nazis and Fascists have changed their salutes. Now both arms go up.

(*Continued on page 8*)

Gives all-around, long-time satisfaction in grinding the chip-breaker groove on carbide-tipped tools — used also for other production grinding.



New Delta Chip-Breaker Grinder is simple, fast, dependable, accurate —and *much lower in cost...*

In grinders costing many times as much, you do not find many of the new, exclusive features you get in this latest Delta machine. It's husky, solid (weight 700 pounds), over 6 feet high, an accurate machine designed to turn out a big volume of work. Yet its cost is amazingly low.

Spindle shaft specially designed. Bearings widely spaced to provide permanently true alignment. Wheel mounting system permits removing either wheel alone, or wheel and adapter. Table is smooth operating with convenient control wheels — rides solidly on long ways.

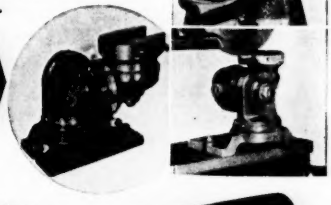
EQUIPPED WITH THE NEW "UNIVISE"

... holds the tool at any conceivable angle

Four distinct planes of adjustment. Can be accurately reset at a moment's notice so that the tool may be reground at **precisely** the same angles as originally set. Saves time, wheel wear. Eliminates bothersome and often inaccurate measurements.

With Univise and coolant attachment removed, this machine may be used as a regular surface grinder.

The features and performance of this Delta machine are amazing to those accustomed to paying far more than its cost. Investigate — be first in your plant to discover the convenience and economy of this new Delta grinder. See it at your Delta industrial distributor's — check priorities and deliveries.



DELTA MILWAUKEE Machine Tools

TEAR OUT AND MAIL THIS COUPON FOR FULL DETAILS

THE DELTA MANUFACTURING COMPANY
706G E. Vienna Ave., Milwaukee 12, Wis.

Please send me your new catalog giving full details on the Delta Chip-Breaker Grinder and your full line of low-cost machine tools.

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Company.....
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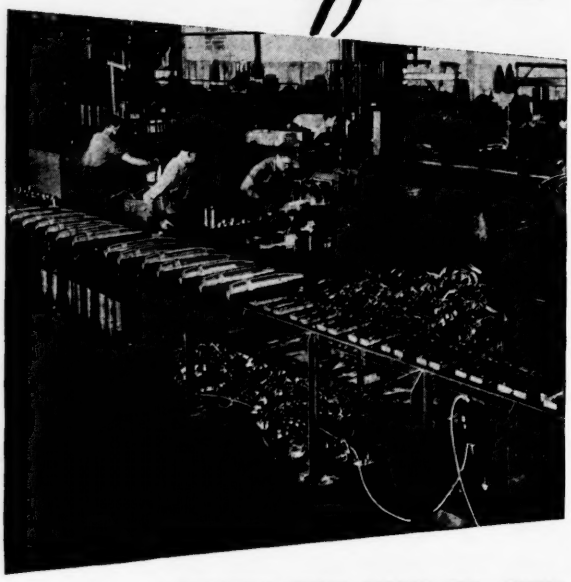
DISH IT OUT *faster!*



THAT'S THE WAY TO WIN this war . . . and that's the way to speed the production of vital war material.

Keeping materials, parts and supplies moving to waiting machines and eager hands with a Mathews Time-Controlled Conveyer System is a sure-fire means of making production schedules "click."

Mathews Engineers are helping American War Industries dish it out faster; perhaps they can also help you.

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION

If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.

MATHEWS CONVEYER COMPANY ELLWOOD CITY PENNSYLVANIA

Timely Comment

(*Continued from page* 7)

There is an old saying "Figures can't lie but Liars can figure." Here are some figures that do not lie. If you want to do your own figuring from them you can do so.

Weekly wages of 25 manufacturing industries as computed by the National Industrial Conference Board now average $45.00 per week or more.

These same wages computed by this same Board for January, 1941 were $30.61.

A letter from one of our regular subscribers says, "I have long been a reader of your good magazine, primarily because it has fit the definition of rugged individualist." Well the magazine is a rugged individual. It is still hale and hearty after sixty-one years. It will continue to say what we, the men who recreate it every month, sincerely and honestly think. It is still a "rugged individualist."

A large part of our working population apparently does not realize that this country is engaged in the biggest war the world has ever known. Leaders of organized labor and strikers persist in exhibiting an indifference to America's needs that is appalling. The coddling of a labor government has exalted them with the result that every consideration but selfishness is thrust aside.

Many of their sons and associates are in the armed forces, while vital industries time after time are tied up by strikes called in many cases for trivial reasons. One would think love of country—the urge for victory over dictators—was good enough reason to give of their best and to put off airing their grievances until victory is won, but that is a mistaken idea. Strike now and often and tie up the war effort, that is the program that is followed.

The testimony before committees of Congress about wages not having kept up with increased living costs has been proven time and again to be untrue, but what of it. Get while the getting is good. What do they care about inflation or war. The pocketbook nerve controls.

An awakening is needed and will surely come. Some bombs from the other side might not be an altogether bad thing.

Quotation from "My Day" published June 22nd and written by Mrs. Franklin D. Roosevelt: "The domestic scene, as you listen to the radio and read the papers today, is anything but encouraging, and one would like not to think about it, because it gives one a feeling that, as a whole, we are not really pre-

pared for democracy."

"Faith, Hope and Charity." Do these words belong in the First Lady's vocabulary?

Is the faith of the millions, who have been deliberately taught to be selfish, to be destroyed or corrected because "one would rather not think about it?"

Is the hope of millions to be taken from them because, having been misguided for political or mush-minded purposes "one would rather not think about it?"

Is the charity of millions towards other millions to be denied because a lady who basks in the reflected light of a husband's position dares to say "we are not really prepared for democracy?"

The picture of confusion, of inter department and bureau bickering, and of clashes between administrative personalities appears to be a grave indictment of democratic government.

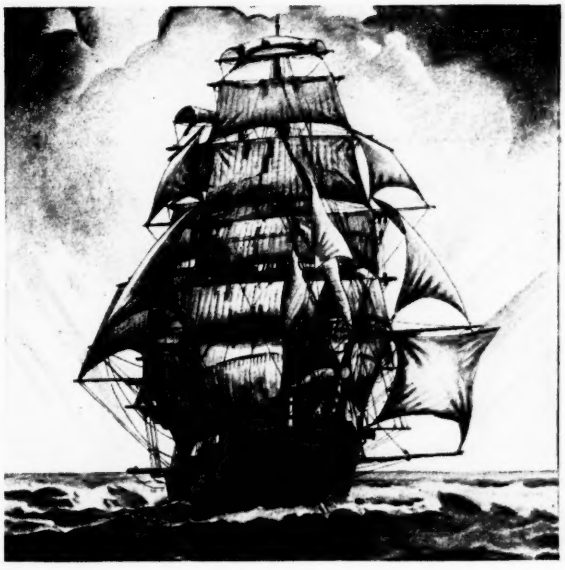
It is nothing of the sort. It is an indictment of government by decree instead of law. It is an indictment of government for political advantage instead of national welfare. It is an indictment of the one man who thinks he is the only man fitted to lead our Nation.

There is something in the old saying: "A new broom sweeps clean."

Raymond J. Funkhauser, business man, president or chairman of the board of at least a half dozen nationally known companies has got so "het up" over the way the domestic affairs of this country are being run that he has started a paper, edited and published from his home town, Charles Town (not Charleston) West Virginia. He calls his paper "The Jefferson Republican." He backs the paper with his own hard cash for he says in his first edition, "If there are any other people who would like to receive copies of the "Jefferson Republican," send in their names and addresses. We will be glad to place them on the mailing list for free copies."

The opinions of men such as Mr. Funkhauser deserve serious consideration, whether one agrees with them or disagrees. They are the bubbling springs of a thoughtful man that when multiplied by enough thoughtful men will insure the perpetuation of our republican form of democracy.

Strange thoughts pop into strange heads, so the other day when letters were received from former friends or associates in the services from Greenland, India and Egypt we were reminded of the old hymn that we sang (tried to sing would be more accurate) years ago. The first line went "From Greenland's icy mountains to India's coral strand." These old-time geographical extremities are not so far apart today as they seemed to be when that hymn was written because Americans are everywhere on the inhabitable parts of the globe.



THE OLD WINDJAMMERS

The old "windjammers" were built to sail the heaviest seas that rolled. In fair weather or foul, with rare exceptions, they delivered their cargoes. It was sturdiness in build, skill in design and quality of materials that made them give such good service.

It is in a like manner that Layne Pumps and Well Water Systems are constructed:—sturdy—efficient—long lasting—and above all, reliable. Some have been in service for a quarter century. Later installations were designed and built to last even longer.

Such outstanding quality will make Layne Pumps and Well Water Systems first in choice for the post-war era. They will be chosen wherever large quantities of water must be produced at exceptionally low cost. Layne Pumps and Well Water Systems have been proven the world over—proven for basically sound quality, advanced engineering features, sturdiness in construction, unequaled efficiency and outstanding reliability.

For the duration the Layne Organization is, in addition to doing much urgent war work, endeavoring to keep present installations in repair and operating at top efficiency. If you wish literature, address, Layne & Bowler, Inc., General Offices, Memphis 8, Tennessee.

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Western Co. of Minnesota, Minneapolis, Minn. * International Water Supply, Ltd., London, Ontario, Canada.

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DEEP WELL PUMPS

Builders of Well Water Systems for Every Municipal and Industrial Need

Suppose it happened. Not a test, this time; the real thing. An aircraft spotter, perhaps in some remote island outpost, suddenly freezes to attention, peers through binoculars . . . leaps to his telephone.

"Enemy planes!" . . . Up and down the coast his message flashes. Myriads of wires relay it, under rivers, over mountains, to airfields and anti-aircraft batteries. Sirens howl. Pilots scramble into cockpits, and dozens of fighter planes roar upward into the sky.

America's coast defense system is tied together by a communication network of wire. In an emergency, this network runs the show, coordinates the interceptor command and helps protect civilians in the cities against falling bombs.

Bethlehem is supplying many tons of bethanized (electrolytically zinc-coated) wire to armor the underwater cables of this vast coastal communications net. We also furnish, through distributors, many miles of telephone wire for use by the U. S. Coast Guard on both the Atlantic and Pacific coasts. This is but one of the many ways in which Bethlehem wire mills are working to protect the home front and to speed the day of victory.

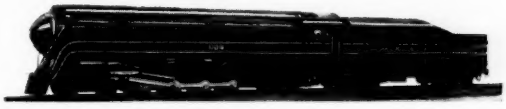
BETHLEHEM STEEL

WAR POWER . . .

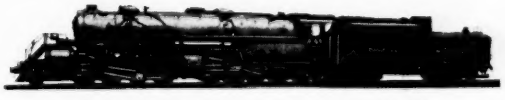
The might and power of our war transportation are the locomotives of America — locomotives that are moving one and one-third million tons of freight a mile every minute and one and one-half million fighting men a month.

Here are three modern powerhouses of concentrated energy in the Norfolk and Western's fleet of locomotives in the service of the nation. Symphonies of steel and power, they were designed and built by the brains, brawn and skill of Norfolk and Western employees in the railroad's shops (as have more than 100 others during recent years). In the front rank of the finest railroad motive power in the world, N. & W. locomotives are proving their mettle — their sound, modern design, careful construction and stamina under the unprecedented strain of wartime transportation.

Locomotives of America! Storied in history and song . . . trail blazers in the development of the nation . . . the vital arteries of transportation in times of peace . . . today, the might and power of war transportation.



Graceful for all its power, this Norfolk and Western streamlined passenger locomotive is roller bearinged, automatically lubricated, weighs 872,600 pounds, in working order, is 109 ft., 2 1/4 in. long, and carries 22,000 gallons of water and 26 tons of coal. With 8 powerful driving wheels 70 inches in diameter, it can flash over the rails at 80 miles per hour and more.



A giant of the rails — a compound Class Y-6 freight — with four cylinders and 16 driving wheels. The mainstay of heavy duty, mass freight transportation, he "weighs in" — with coal and water — at nearly a million pounds, is 114 ft., 10 1/2 inches long, roller bearinged, and automatically lubricated.

Into this long (120 ft. 7 1/2 in.) racy locomotive has been built power and speed. A combination freight and passenger, it takes on any tough job. It flashes over the rails with long passenger trains, or pulls with ease and dispatch a heavy merchandise freight train. This Class A weighs 951,600 pounds in working order, has twelve 70 inch driving wheels, roller bearings, and a fire box 122 square feet in size.

BUY MORE WAR BONDS

NORFOLK and WESTERN *Railway*

ONE OF AMERICA'S RAILROADS . . . *All* UNITED FOR VICTORY!

Africa is Mafeesh* (FINISHED)

NEXT STOP ??????

When the next invasion comes Clark Fork Trucks will be there delivering the goods as they did in Africa

(SEE PHOTO BELOW)

BUY MORE BONDS TO KEEP 'EM ROLLING

CLARK FORK TRUCKS AT WORK IN R. A. F. ADVANCED AIR BASE, NORTH AFRICA

ARMY E NAVY

CLARK TRUCTRACTOR

DIVISION OF CLARK EQUIPMENT COMPANY

BATTLE CREEK, MICHIGAN, U.S.A.

for outstanding performance

. . . on the Production Front

The Army-Navy "E" flag, signifying exceptional performance in the production of war materials, now flies over two of the Chicago Bridge & Iron Company's shipyards. Over 11,000 of our employees are privileged to wear the "E" pin in tribute to their war production effort.

It's been said that this is the age of production miracles. But is it? To those who *really* know American industry, today's staggering production figures cause no surprise.

The foundations for these so-called production miracles were laid years and generations *before* Pearl Harbor. The needs of war have brought to light the vast amount of "know how" which industry has accumulated through years of research and experimentation. This knowledge of how to accomplish things *fast* and *well*, is enabling our nation to mete out the potent weapons of war at a rate that augurs disaster for our enemies.

The Chicago Bridge & Iron Company is proud to serve the war effort both directly and indirectly. In addition to the increasing number of ships and floating dry docks being launched from our yards, our plants are designing and fabricating Hortonspheres, Hortonspheroids, tanks and pressure vessels of all descriptions for the petroleum industry, the synthetic rubber program and other vital phases of our country's vast war production.

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Cleveland .....2216 Guildhall Building

Chicago .....2106 McCormick Building
San Francisco .....1040 Rialto Building
Philadelphia...1619-1700 Walnut Street Building
Havana .....402 Edificio Abreu
Washington .....330 Bowen Building

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PENNSYLVANIA

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SOTED PILES and TIMBER

FOR EVERY CONSTRUCTION PROJECT

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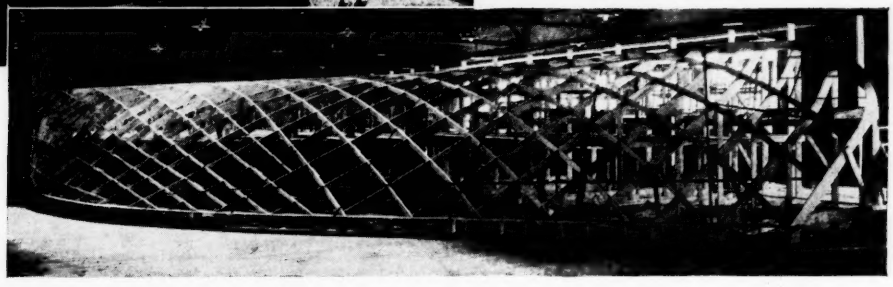
"What Next"?

For the Victory Pattern



TO COMPLETE the Pattern of Victory, structural steel must be bent, shaped and fitted to an almost endless variety of uses, and as the many unusual forms appear on our assembly yards we are made to wonder "What Next"—but whatever it is, we have probably handled similar jobs before. Complicated and unusual construction involving precision workmanship has been a Virginia Bridge specialty for nearly fifty years.

The versatility and flexibility of our engineering and fabricating resources are available NOW for any war project, and after victory is won we will be even better prepared for peacetime construction by reason of our wartime experience.

Three plants strategically located at Roanoke, Birmingham and Memphis, under the direction and planning of a single compact organization, offer many practical operating advantages and economies for any construction project in the South and Southwest.

Virginia Bridge Company

(South's Largest Structural Steel Fabricator)

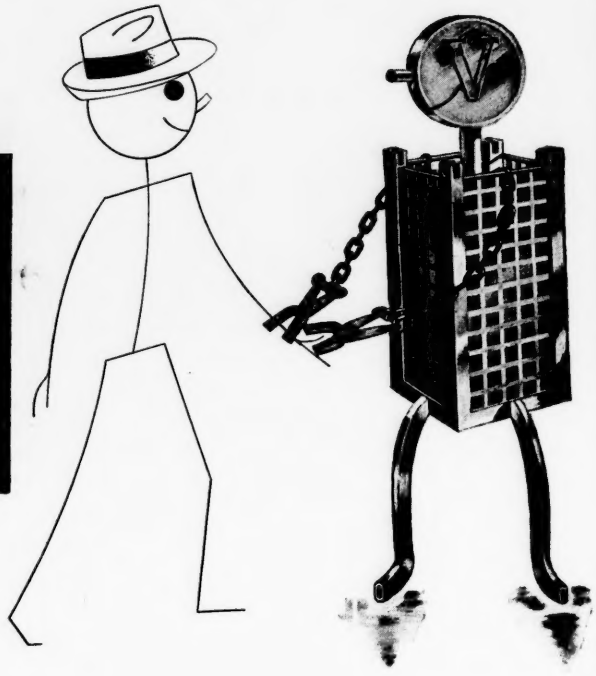
STEEL STRUCTURES
All Types

Plants: ROANOKE, VIRGINIA
BIRMINGHAM, ALABAMA
MEMPHIS, TENNESSEE

ROANOKE BIRMINGHAM ATLANTA MEMPHIS NEW YORK DALLAS

UNITED STATES STEEL

WE HAVE THIS TO SAY ABOUT NICKEL



Nickel is a good mixer.

We ourselves use nickel. It increases the strength of alloys at higher temperatures. It's in our vital Alcoa Aluminum Alloy employed for cylinder heads on air-cooled aircraft engines.

Nickel does plenty in its own name, too. It proudly walks where other metals fear to tread—into pickling baths and brine tanks, for instance.

What nickel is doing to help create high octane gas and the wonders of electronics is better kept smoke-screened until after the war. But we believe in looking squarely, right now, at the new toughness, new corrosion-resistance, new electrical possibilities nickel is creating.

It's up to Imagineers to see all the developments of today in terms of jobs for tomorrow. To let the imagination soar now and have it engineered down to earth in time to start producing as soon as peacetime jobs are needed . . . that's the purpose of Imagineering.

Looking over the war-born opportunities, Imagineers are bound to come upon aluminum in surprising places. Plain ordinary economies have greatly increased the possible applications of aluminum. War production has greatly increased the number of people who know how to work with aluminum.

These, too, add up to the stuff that will make jobs.

But Imagineering isn't concerned so much with which material shall be used. That will be answered by where you want it and what you want it to do. After seeing how aluminum gets around during this war, we're not worried about leaving it on its own in mixed company. The important thing now is to imagineer the places for mixing the company.

How much of the new materials are you planning to put to work? And exactly where, if you please . . .

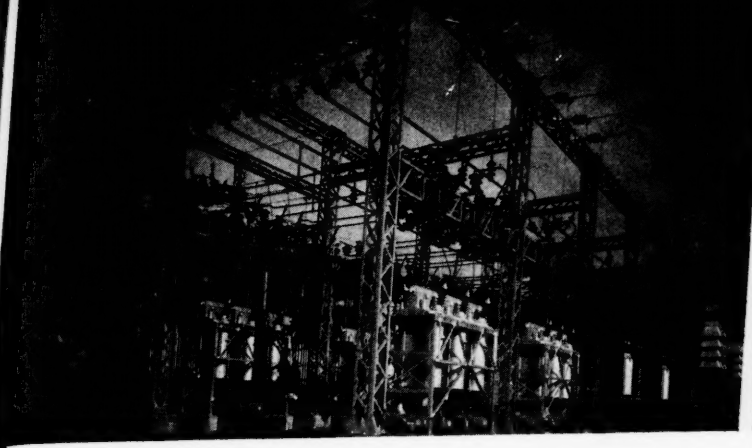
That's the fifty-five-million-job question!

ALUMINUM COMPANY OF AMERICA, 2109 Gulf Building, Pittsburgh, Pennsylvania.

IMAGINEERING AT WORK

Alcoa Aluminum

ALCOA ALUMINUM



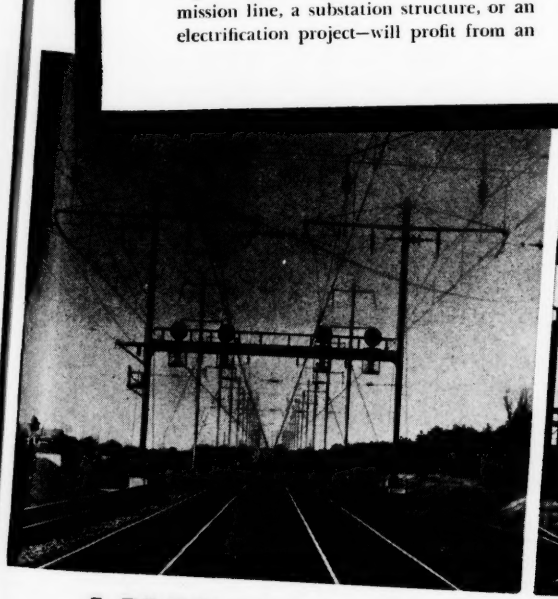
Engineering Resourcefulness

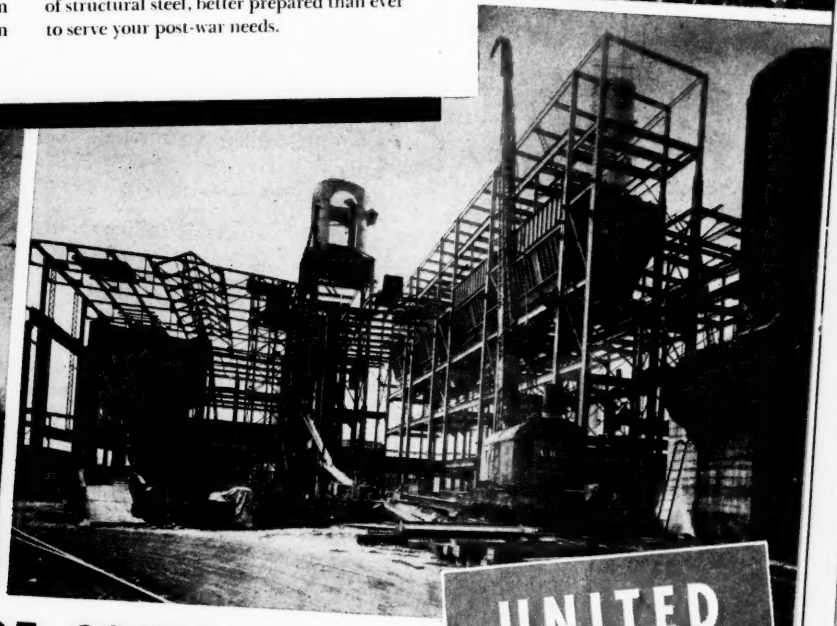
—a "plus" for your structural jobs

DURING the many years we have fabricated and erected steel structures for the electric power industry, one characteristic of American Bridge service has had more to do with the success of the jobs we have handled than anything else. It isn't a tangible factor. We can't write it into contracts. But every project benefits from it. You may have heard it called *engineering resourcefulness.*

What is this quality worth to you? . . . It means that every job American Bridge undertakes—whether it is the steelwork for a generating station, the towers for a transmission line, a substation structure, or an electrification project—will profit from an unsurpassed background of structural experience. It means that each project, no matter how large or how small, will receive the same painstaking care in planning, fabrication and construction.

Engineering resourcefulness gave our organization its worldwide scope of operation. This same resourcefulness now is enabling us to serve the war needs of our country in numerous ways, including even the manufacture of high-precision military equipment. We value this opportunity. But when peace returns, you'll find us "doing business at the old stand" as fabricators and erectors of structural steel, better prepared than ever to serve your post-war needs.





AMERICAN BRIDGE COMPANY

General Offices, Frick Building, Pittsburgh, Pa.

District Offices in: Baltimore · Boston · Chicago · Cincinnati · Cleveland Denver · Detroit · Duluth · Minneapolis · New York · Philadelphia · St. Louis

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

USS UNITED STATES STEEL

What does a steel man know about grading tomatoes?

THIS one knows plenty about it! . . . He's a T.C.I. Farm Products Agent.

He works for a steel company, but his sole job is to help farmers make more money.

Operating in every Southern state, T.C.I. Farm Products Agents are picked agricultural experts who devote their efforts to improving grades, locating buyers, and developing new and better markets for farm products of all kinds. Their work is correlative with that of the agricultural colleges, departments of agriculture, and other agencies seeking to enlarge the income and buying power of the Southern farmer.

Naturally, the work of our Farm Products Agents helps us to sell more U·S·S steel products, by increasing the farmer's ability to buy them.

It also increases the farmer's ability to buy other products and services . . . yours, for instance.

But even more important, we think, is the fact that whatever helps the Southern farmer helps to build prosperity for the whole South. Steel's own farm experts grading tomatoes and rendering many other important services to agriculture are doing their part to develop the nation's next great market.

U·S·S Steel Products manufactured in our mills include:

- Rolled, forged and drawn steel products.
- Structural shapes, plates, bars, small shapes, agricultural shapes, tool steel, strip, hoops, cotton ties.
- Black, galvanized and special finish sheets.
- Wire and wire products.
- Reinforcing bars.
- Rails, track accessories, axles and forgings.
- Culverts, Panelbilt prefabricated steel buildings, cold-formed steel sections.
- U·S·S High Tensile Steels and U·S·S Abrasion-Resisting Steels.
- Semi-finished products, pig iron and ferromanganese.

TENNESSEE COAL, IRON & RAILROAD COMPANY

Birmingham, Alabama

This flag awarded to manufacturing divisions of Ensley, Fairfield and Bessemer

UNITED STATES STEEL

HAD TO COME...

...the "Visi-matic" Calibration Plate

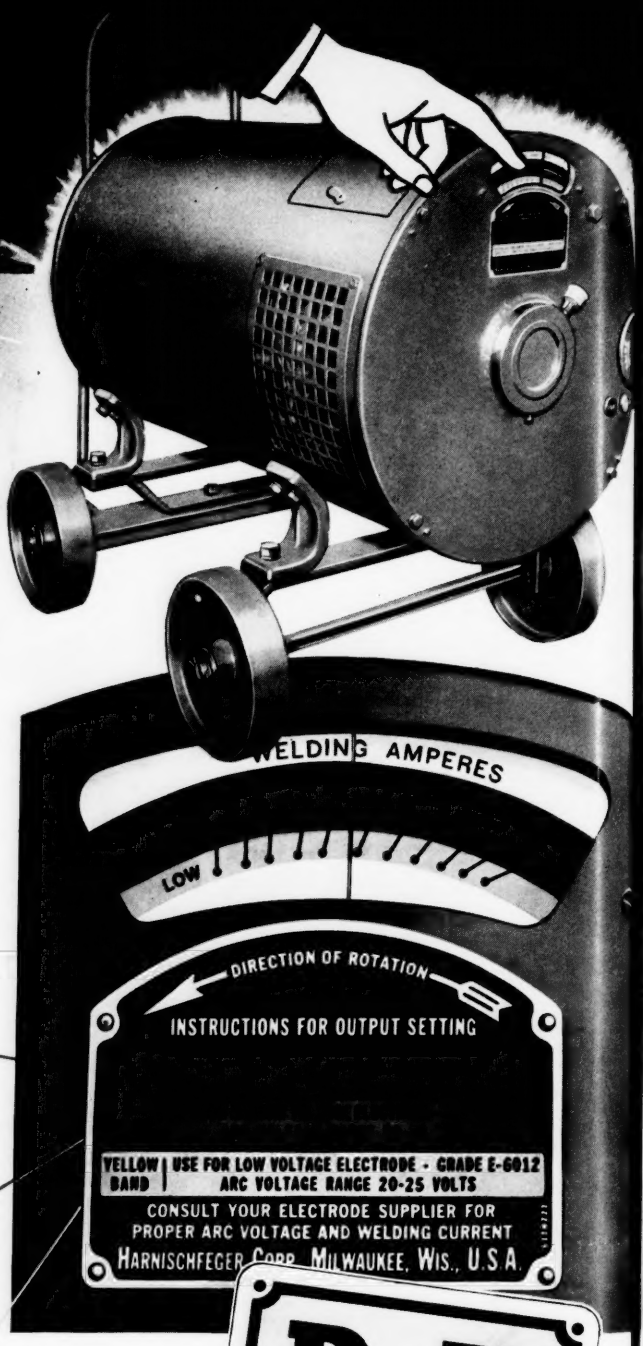
Modern developments in welding electrodes have imposed new and more complex problems upon users. Now, with the many new variations in electrode coatings, accurate results require that you know what your WSR ratings are so that you can select exactly the right heat across the arc for each electrode.

To help you weld more efficiently . . . to take full advantage of present and future advancements in electrodes . . . P&H has developed the new "Visi-matic" Calibration Plate. Simple, easy to read, it eliminates guesswork by permitting you to select the *exact* heat required for each size and type of electrode.

As with other P&H advancements, the one thought behind the new "Visi-matic" Calibration Plate is to help you make *better welds, more easily, at lower cost.*

See Next Page ☛

NOW
ACCURATE HEAT CONTROL
is a simple matter


WELDING AMPERES
LOW
DIRECTION OF ROTATION
INSTRUCTIONS FOR OUTPUT SETTING
YELLOW BAND
USE FOR LOW VOLTAGE ELECTRODE - GRADE E-6012
ARC VOLTAGE RANGE 20-25 VOLTS
CONSULT YOUR ELECTRODE SUPPLIER FOR PROPER ARC VOLTAGE AND WELDING CURRENT
HARNISCHFEGER CORP. MILWAUKEE, WIS., U.S.A.

The new P&H "Visi-matic" Calibration Plate provides three color bands, corresponding to the three electrode groups for low, medium, or high voltage requirements.

Settings Provide For Varying Heat Requirements

Calibrated in amperes, the new "Visi-matic" Plate is used with any make of electrode. Not only does it enable you to compensate for variations in voltage with the amount of current or amperes, but also for the variations in coatings as illustrated by the typical electrodes below:

Down Hand
—Coatings burn off at a much slower rate than metal and therefore require higher voltages to insure ample heat across the wider arc gap.

All Position
—Coatings burn down more slowly than metal but the difference is not so great as in Down Hand.

over it
—Metal and coatings burn at approximately the same rate of speed. Amperage requirements are the lowest of the three groups.

By merely setting the stylus at the dot opposite the desired amperage, you are sure of the correct heat across the arc *on every job.*

WSR (*Welding Service Range*) Ratings

All P&H Arc Welders are rated on WSR which is actual delivered output. You know exactly how much heat your machine will deliver from minimum to maximum.

Single Current Control

With P&H's single control, you have but one simple adjustment to obtain *any* welding heat within the machine's range. Arc response is automatic on all classes of work—with all types of electrodes.

P&H's outstanding advantages are: (1) Known Welding Service Range; (2) "Visi-matic" Calibration; and (3) Automatic Arc Response—all of which are accomplished with (4) Single Control for Welding Heat. Literature will be sent on request.

P&H ARC WELDERS

The complete line of P&H Arc Welders includes both A.C. and D.C. types in a wide range of capacities. All machines are rated on WSR (Welding Service Range). P&H also manufactures a complete line of welding electrodes.

HARNISCHFEGER CORPORATION

ARC WELDERS · EXCAVATORS · ELECTRIC CRANES · P&H · MOTORS · HOISTS · WELDING ELECTRODES

GENERAL OFFICES: MILWAUKEE, WISCONSIN

Canadian Distribution: **The Canadian Fairbanks-Morse Co., Ltd.**

War Plant

Southern cotton is fine . . . for sheets and towels and little girls' dresses.

It's fine, too . . . for the smokeless powder used in shells and bullets . . . for tents and machine gun belts and uniforms . . . for more than 11,000 different products in U. S. Army specifications.

But cotton is just one of the many vital products which the Southland is contributing to help win the war. There's coal and oil and steel. Timber and aluminum. Food and chemicals. And they all ride to war in the freight trains of the Southern Railway System.

The men and women of the Southern know that this fighting freight is potent poison to America's enemies. So they bring a fighter's devotion to their jobs.

A fast freight schedule is set up . . . then someone figures a way to make it faster.

Every freight train is loaded to the limit . . . then someone finds a way to raise the limit.

Repairs are made in record time . . . then someone proceeds to break the record.

This ability and ingenuity, invaluable in time of war, will be a rich asset to the South in peacetime. For these men and women of the Southern Railway will carry the goods of the New South . . . with the same energy and efficiency with which they now rush fighting freight to war.

Ernest E. Norris
President

"Look Ahead . . . Look South"

SOUTHERN RAILWAY SYSTEM

The Southern Serves the South

In ten more minutes what will you be doing?

IN TEN MORE MINUTES they'll be in action—American fighters risking life and limb to conquer one more bridgehead on the road to freedom.

And in ten more minutes—what will *you* be doing to help win this war?

Because it's up to you as much as it's up to them. Unless you—and all the rest of us at home—are devoting every spare minute of our time to fighting this war as civilians, *their* chances of victory are slim.

Next time you read of an American raid on enemy positions—with its tragic footnote of lost planes and ships and men—ask yourself:

"What *more* can I do today for freedom? What *more* can I do tomorrow that will save the lives of men like this and help them win the war?"

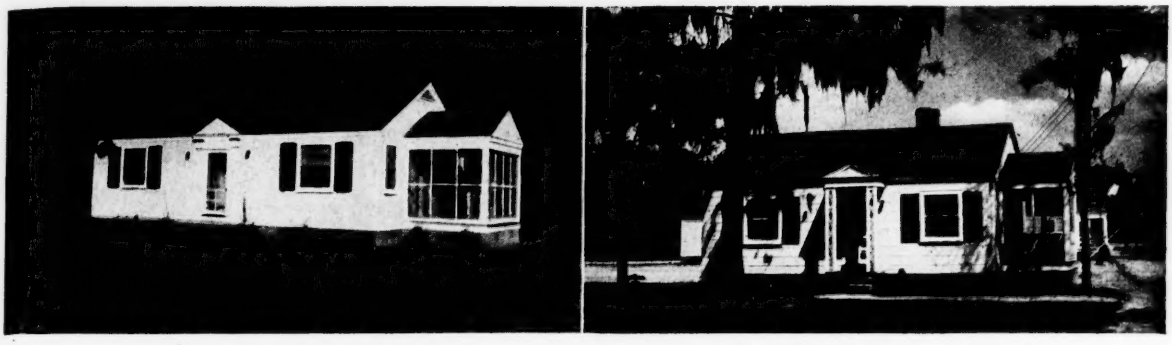
* * *

To help you find *your* place in America's War for Freedom, the Government has organized the Citizens Service Corps as part of local Defense Councils. Probably there is one of these Corps operating now in your community. Give it your full co-operation. If none exists, help organize one.

Write to this magazine for a free booklet, "You and the War," telling you what to do and how to do it. This is *your* war. Help win it. Choose what you will do now!

EVERY CIVILIAN A FIGHTER

Contributed by the Magazine Publishers of America



A close-up view of the modern 5-room and 4½-room homes at Port Wentworth, near Savannah

NEW AND ENLARGED HOUSING

for post-war industry moving South

INDUSTRIALISTS making a study of plant locations in the South will find the one problem of housing adequately met at Port Wentworth, near Savannah, Ga. Facilities for office employees and junior executives, and for workers both white and colored, are now available. The Village of Port Wentworth is an up-to-date, permanent development, with houses of the very best construction materials: brick foundations, hardwood floors, Crane plumbing and fixtures; electric ranges and refrigerators.

★

Healthful conditions abound; no crowding, plenty of space for fresh air, outdoor gardening and other forms of recreation. The lots are more than average size.

Port Wentworth housing is not a war project in the sense that the houses are thrown together quickly with cheap materials. New houses have been built like those here illustrated and older houses are remodeled. Most of the houses have five rooms and a few are smaller.

★

The Town of Port Wentworth has been carrying out a plan of public improvements to care for the increased number of workers and families. Expansion of the water works plant more than doubles its former capacity, new streets are built and old streets improved.

★

Industrialists seeking Southern plant locations will find every major requirement for ideal war and post-war manufacturing plants.

Ask for information on housing, transportation, raw materials and other requirements to meet your specific problems.

PORT WENTWORTH CORPORATION

New York—17 E. 42nd. St. Savannah—Box 1094

One of the many streets where the new 5-room houses have been constructed

The Successful Executive of the Future Must Be Aggressive, Cost Conscious and Selling Minded

BUY MORE WAR BONDS

"You've Got to Spend Money to Make Money"

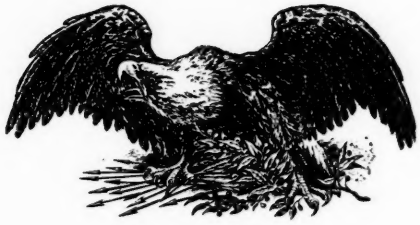
GEORGE S. MAY COMPANY

CHICAGO
May Building
2600 North Shore Ave.

CANADA: 320 Bay St., Toronto

NEW YORK
Chanin Building
122 East 42nd Street

OFFICES IN PRINCIPAL CITIES



The Declaration of Independence

(A Document as vital today as when written that should be reread by every American citizen)

When, in the course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth the separate and equal station to which the laws of nature and of nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident: That all men are created equal; that they are endowed by their Creator with certain inalienable rights; that among these are life, liberty, and the pursuit of happiness; that, to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed; that, whenever any form of government becomes destructive of these ends, it is the right of the people to alter or to abolish it, and to institute a new government, laying its foundation on such principles, and organizing its powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes; and, accordingly, all experience hath shown that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same object, evinces a design to reduce them under absolute despotism, it is their right, it is their duty, to throw off such government, and to provide new guards for their future security. Such has been the patient sufferance of these colonies; and such is now the necessity which constrains them to alter their former systems of government. The history of the present king of Great Britain is a history of repeated injuries and usurpations, all having in direct object the establishment of an absolute tyranny over these states. To prove this, let facts be submitted to a candid world.

1. He has refused his assent to laws, the most wholesome and necessary for the public good.

2. He has forbidden his governors to pass laws of immediate and pressing importance, unless suspended in their operation till his assent should be obtained; and, when so suspended, he has utterly neglected to attend to them.

3. He has refused to pass other laws for the accommodation of large districts of people unless those people would relinquish the right of representation in the legislature—a right inestimable to them, and formidable to tyrants only.

4. He has called together legislative bodies at places unusual, uncomfortable, and distant from the depository of their public records, for the sole purpose of fatiguing them into compliance with his measures.

5. He has dissolved representative houses repeat-

edly for opposing, with manly firmness, his invasions on the rights of the people.

6. He has refused for a long time, after such dissolutions, to cause others to be elected; whereby the legislative powers, incapable of annihilation, have returned to the people at large for their exercise; the state remaining, in the meantime, exposed to all the dangers of invasions from without and convulsions within.

7. He has endeavored to prevent the population of these states; for that purpose obstructing the laws for naturalization of foreigners; refusing to pass others to encourage their migration hither, and raising the conditions of new appropriations of lands.

8. He has obstructed the administration of justice by refusing his assent to laws for establishing judiciary powers.

9. He has made judges dependent on his will alone for the tennure of their offices and the amount and payment of their salaries.

10. He has erected a multitude of new offices, and sent hither swarms of officers to harass our people and eat out their substance.

11. He has kept among us, in times of peace, standing armies, without the consent of our legislatures.

12. He has affected to render the military independent of, and superior to, the civil power.

13. He has combined with others to subject us to a jurisdiction foreign to our Constitution and unacknowledged by our laws, giving his assent to their acts of pretended legislation:

a. For quartering large bodies of armed troops among us.

b. For protecting them, by a mock trial, from punishment for any murders which they should commit on the inhabitants of these states.

c. For cutting off our trade with all parts of the world.

d. For imposing taxes on us without our consent.

e. For depriving us, in many cases, of the benefits of trial by jury.

f. For transporting us beyond seas to be tried for pretended offenses.

g. For abolishing the free system of English laws in a neighboring province, establishing therein an arbitrary government, and enlarging its boundaries so as to render it at once an example and fit instrument for introducing the same absolute rule into these colonies.

h. For taking away our charters, abolishing our most valuable laws, and altering fundamentally the forms of our governments.

i. For suspending our own legislature and declaring themselves invested with power to legislate for us in all cases whatsoever.

14. He has abdicated government here by declaring us out of his protection, and waging war against us.

15. He has plundered our seas, ravaged our coasts, burnt our towns, and destroyed the lives of our people.

16. He is at this time transporting large armies of foreign mercenaries to complete the works of death, desolation, and tyranny, already begun with circumstances of cruelty and perfidy scarcely paralleled in the most barbarous ages, and totally unworthy the head of a civilized nation.

17. He has constrained our fellow-citizens, taken captive on the high seas, to bear arms against their country, to become the executioners of their friends and brethren, or to fall themselves by their hands.

18. He has excited domestic insurrections amongst us, and has endeavored to bring on the inhabitants of our frontiers the merciless Indian savages, whose known rule of warfare is an undistinguished destruction of all ages, sexes, and conditions.

In every stage of these oppressions we have petitioned for redress in the most humble terms; our repeated petitions have been answered only by repeated injury. A prince, whose character is thus marked by every act which may define a tyrant, is unfit to be the ruler of a free people.

Nor have we been wanting in our attentions to our British brethren. We have warned them from time to time, of attempts by their legislature to extend an unwarrantable jurisdiction over us. We have reminded them of the circumstances of our emigration and settlement here. We have appealed to their native justice and magnanimity, and we have conjured them by the ties of our common kindred to disavow these usurpations, which would inevitably interrupt our connections and correspondence. They, too, have been deaf to the voice of justice and of consanguinity. We must, therefore, acquiesce in the necessity which denounces our separation, and hold them, as we hold the rest of mankind—enemies in war; in peace, friends.

We, therefore, the representatives of the United States of America, in general Congress assembled, appealing to the Supreme Judge of the world for the rectitude of our intentions, do, in the name and by the authority of the good people of these colonies, solemnly publish and declare that these united colonies are, and of right ought to be, free and independent states; that they are absolved from all allegiance to the British crown, and that all political connection between them and the state of Great Britain is, and ought to be, totally dissolved; and that as free and independent states, they have full power to levy war, conclude peace, contract alliances, establish commerce, and to do all other acts and things which independent states may of right do. And for the support of this Declaration, with a firm reliance on the protection of Divine Providence, we mutually pledge to each other our lives, our fortunes, and our sacred honor.

Political Prostitution

The New Deal has prostituted the Democratic party.

The MANUFACTURERS RECORD is not a partisan paper. It favors neither Democrats nor Republicans as such, but it is unalterably opposed to any clique or group that seeks to undermine, either by its acts or intentions, the form of government guaranteed to all Americans of every race and creed by the CONSTITUTION OF THE UNITED STATES.

Those who doubt that the Democratic party has been lying supine with the knee of the New Deal in its groin for the past ten years should ask themselves the following questions:

What has happened to States Rights? A city traction company is now declared to be in interstate commerce.

What has happened to the right to work? Every one knows of initiation fees and dues that must be paid to labor organizations for a right guaranteed to all of us.

What has happened to freedom of speech and of the press? Mud slinging by government paid mud slingers and thousands of tons of government propaganda press releases for gullible editors to reprint.

What has happened to the business man, the man who operated a small business himself and was proud of his accomplishment? Look around at your friends and associates and you will see the answer.

What has happened to the farmer? He has been told what to plant, how much to plant and where to plant it. He has been told to plow under crops, kill livestock and even abandon farms.

What has happened in the relations of Americans one with the other? They have been impregnated with class feeling for purely political purposes. Workmen of today are being taught that they will be workmen tomorrow, not that they may be foremen, superintendents and company presidents in a free land of free opportunity.

What has happened to the Negro? There are race riots both North and South. The Negro forms an important segment of our population. He should not be exploited for political purposes.

What has happened to the real leaders of the Nation, those men with practical experience and ordinary, everyday common sense? They have been deliberately sidetracked to make places for New Deal misfits, often "lame ducks" who have been defeated in popular elections.

Readers of the MANUFACTURERS RECORD should ask themselves these questions. They should answer them, not as self-seeking individuals, but as citizens who have their country's welfare at stake.

It is time that the New Deal bacillus be purged from the Democratic party of Jefferson, Jackson, Cleveland, and Wilson. If this is not done by the many fine public spirited men who should be its backbone, the Democratic party will be permanently laid to rest when the victorious boys come back home, trained, and tough and loyal—and raring to go.

A Bright Side

There is a huge national chorus from newspapers and magazines and commentators, swelled by thoughtful letter writers, criticizing the abysmal ignorance and selfishness of blocs and of the administration in Washington and much of the criticism is fully justified.

Fortunately and in spite of these things there is a bright side to the picture.

Our armed forces—and this is written from the point of view of a man who spent quite a few months in France during the last war—are, beyond the shadow of a doubt the best in the world. Their personnel, officers and men, have been taught to attack. They have been taught that the word "defeat" and the word "can't" do not belong in a war time dictionary. In the parlance of the prize ring they can get up off the canvas and swing one from the floor, and when they swing it, it lands.

Our boys and young men in the services are to be envied. They are the flower of our nation. They are learning by the real and the hard way that liberty is not an endowment but that it must be cherished to be enduring. They are to be envied because they are making the sacrifices that should shame any of us civilians who complain and who do not devote our thoughts and time to correcting domestic conditions that delay the job they are doing.

Business, handicapped as it has been by government regimentation, is also doing its job. It is supplying implements of war for all of the United Nations and the means of transportation to get them where they may be used. It has created marvels of ingenuity and has produced them in unbelievable quantities. It is the living proof of the value of individual initiative.

Knowing these things, and with pride in the accomplishment attained and with confidence in the patriotism of our people, it is not worthy of any of us to become dispirited because of mistaken governmental ideas that are within our power to correct.

COTTON SERVING THE NATION

Top—Ski troopers in action wearing the reversible cotton ski troopers uniform (U. S. Army Signal Corps photo). Top center—This cotton jungle hammock is being given its final inspection at the Philadelphia Quartermaster Depot. (Photo Section, Phila. Q.M. Depot). Lower center—Inflatable life rafts made of rubberized cotton being given the finishing touches at a Goodyear Tire & Rubber Co. plant. Bottom—Testing textiles as to their tensile strength at the Philadelphia Quartermaster Depot. (Photo Section, Phila. Q.M. Depot).

By

J. LESTER CRAIN
National Cotton Council

"AS tough as hide," "As soft as down," "As strong as steel" —these are familiar expressions today describing various cotton products. Each of these properties is in the production of equipment and supplies for our Armed Forces, and for our essential civilian needs. Cotton, versatile and plentiful, is the No. 1 War Crop, and has been referred to by the Quartermaster Corps of the United States Army as second only to steel as the most vital war material.

It is difficult for the average citizen to visualize the myriad items in which cotton is the principal raw material. A literal translation of "myriad" would not make the above statement an exaggeration for the Army alone uses approximately 11,000 different items made of cotton. In addition to the usual articles of clothing and shelter, cotton is pinch-hitting for such unrelated critical materials as leather, aluminum and jute—to name a few of the many substances from which articles that are very scarce, yet necessary, are made. Many of these new uses of cotton products are interesting because they are unusual applications of the ordinary cotton fabrics. Others hold the interest of not only the cotton industry, but those industrial engineers engaged in the manufacture of automobiles, airplanes, ships, shoes, luggage—and home builders as well—since these new developments are the results of scientific research and possess built-in properties for specific uses. Although a large number of these new cotton products developed as substitutes for scarce materials have done such a splendid job that they are now on the critical list, a discussion of these new uses at this time may be of general interest, and may stimulate thinking in terms of other applications when materials are available again.

Some of the articles of clothing worn by our troops are so foreign to our old ideas of cotton as a summertime fabric that an entirely new field may be opened to cotton. For centuries cotton has been looked upon as a warm weather material, and never as the best protection against killing cold. This conception of cotton clothing was shaken by Admiral Byrd at the South Pole when he discovered that a tightly woven cotton fabric possessing strength, wind-resistance and a natural high water-repellency is a better protector against Arctic cold than furs and the wool clothing usually associated with cold weather. Using this information and the advice of other world-renowned explorers, the Quartermaster Corps has developed clothing for our forces in the Arctic regions which consists of soft, light layers of insulating material, covered with a wind-resistant cotton fabric. For the ski and snowshoe troops, it has designed a parka made of two water-repellent, wind-resistant cotton poplins sewn together. One is white and the other olive drab, so that either side may be worn for camouflage purposes. Our aviators required warm clothing that was not too bulky to hinder their movements and the Quartermaster Corps met this need by the development of an electrically heated cotton flying suit.

A tough fabric was badly needed by the Quartermaster Corps for the trousers of mountain troops. The tests on various materials conducted at their Philadelphia Depot, which maintains one of the largest and best equipped testing laboratories in the world, showed that a new cotton sateen fabric with extraordinarily high tearing

strength and abrasion resistance was the best that could be found for this purpose.

Jungle sleeping equipment is an example of the ingenious manner in which cotton's all-round usefulness is being employed. A comfortable hammock, which can be suspended between two trees, is virtually a small room. It contains a mattress pad, a netting to keep out insects, a sling for the soldier's rifle, and a waterproof covering all made from cotton. Another type of jungle hammock designed by the Quartermaster Corps is made of cotton tire cord and weighs only 22 ounces—yet it can support the weight of 5 men. It is known as the all-purpose hammock, as it is used as a carrying bag, as camouflage in open terrain, as a hygenic suspension over mud in foxholes, and even as a fishing net.

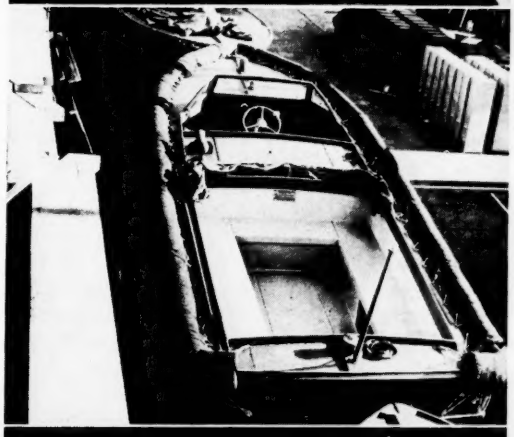
Rapid strides have been made in the past few years in the development of finishes to render cotton fabrics resistant to fire, water and mildew. These developments are being fully employed by both our Armed Forces and industry, and are responsible for many new applications of cotton fabrics. For example, bandoleers worn by our Jungle Troops are made of cotton. A recent edition of the dictionary defines bandoleer as "A broad leather belt, worn over the shoulder and across the breast, for holding ammunition." Leather mildews very rapidly in the jungle, and has been replaced by cotton. Cotton belting is not only used for bandoleers, but also for rifle slings, machete cases, and for machine gun shell carriers.

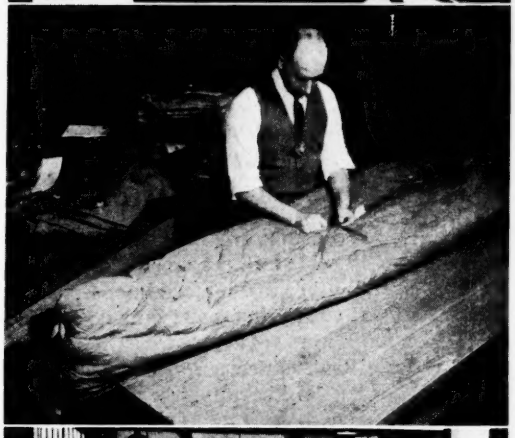
Cotton boots, washable and rotproof against soil chemicals and micro-organisms are furnished our jungle troops. Made of 90% cotton and having rubber soles, they outwear three to five pairs of good G.I. shoes. In addition, these cotton boots allow better ventilation, thus providing greater comfort for the wearer. In contrast, our troops in the extremely cold, dry interior of Alaska get cotton "Muckluck" shoes, with a burlap innersole. These shoes are worn over three or four pairs of socks, and are wind resistant, even though sufficiently porous to permit the evaporation of perspiration.

The "Mareng Cell" is primarily a gasoline tank for airplanes, and is being used extensively for this purpose. This is a good example of the innovations that may be expected by the combined use of cotton with various newly developed synthetic rubbers and resins as coating substances. These tanks are located in the wings of airplanes, and as the dimensions of the cells are slightly larger than the interior of the wings, the entire space is used as the cell is filled with gasoline. These cells are now being experimented with for use in freight cars and motor trucks for the transportation of fuel oil and motor fuel to the Eastern Seaboard. Large quantities of motor fuel must be kept at our ever-changing battle fronts and the use of these light-weight bags is expected to be a big factor in expediting this work. Another important plane equipment problem in which cotton fabric has made a contribution is the self-sealing fuel cells for combat planes and vehicles. The inner lining of these cells is made of a specially coated cotton fabric.

In addition to bandages, swabs, tapes, and other first aid supplies, cotton in an entirely different form is helping to save the lives of our fighting men. All cotton supply parachutes are used to deliver food and ammunition to marooned troops, and cotton duck is the base fabric in rubberized lifeboats that are furnished plane crews. An effort has been made to protect the men drifting in these life boats for a long period of time. A cotton fabric to serve as a roof for relief from rain, wind and the burning sun is now part of their standard equipment. This fabric is coated blue on one side to camouflage the raft, and bright yellow on the reverse to be used for attracting friendly searching planes. Rubber coated cotton fabrics are also used for pontoons of temporary bridges, and cotton tarpaulins are wrapped around war equipment to help float it across streams.

(Continued on page 58)





Top—High boots made of a special cotton fabric have been devised for the use of the armed forces engaged in special activities. (Photo Section, Phila. Q.M. Depot). Top center—An airfoam-equipped U. S. Navy personnel boat with protective padding of airfoam in cotton canvas cylinders around the gunwales to protect seaplanes from damage while being serviced. Lower center—Final inspection of a cotton sleeping bag. (Photo Section, Phila. Q.M. Depot). Bottom—A rubberized cotton pontoon on which heavy steel treadways are placed to form rafts for ferrying or as a bridge.

Alcohol from Waste Sulphite Liquor

Canadian mill experience may open way for new southern industry

ALTHOUGH alcohol has been made from waste sulphite liquor in Europe for a number of years, its production at the Thorold, Ontario, plant of the Ontario Paper Company, Ltd., is the only such source at the present time anywhere in the Americas. As such it is very interesting, not only as an important war project, but as a trial plant of the North American sulphite industry. Also, it will serve to demonstrate a potential use for what is possibly our greatest single industrial waste under the conditions which maintain in this continent.

Undertaken by the Ontario Paper Co. Ltd. at its own expense, it was at the request of the Canadian Department of Munitions & Supply that this company started production of alcohol from waste sulphite liquor in order to meet the war demand for ethyl alcohol.

Production of alcohol by fermentation, whether it be from molasses, grain, waste sulphite liquor or other raw material, results from the action of yeast on sugars. Not all kinds of sugar are suitable, and it is the "fermentation sugar" content of his supply in which the alcohol maker is interested. The sugars in waste sulphite liquor are derived from the wood. Some sugar is present in all wood, and more is formed during the chemical process which is employed for producing sulphite pulp. Waste sulphite liquor contains about 1.5 per cent fermentable sugars, and though this may seem to be a very small percentage, the volume of this waste liquor is so large that sulphite mills in the United States discharge about 375,000 tons of sugar per year. The Canadian mills are said to be similarly releasing at the present time about 225,000 tons of sugar per year—making a total for the two countries of 600,000 or more tons of sugar per year.

The process employed by the Ontario Paper Company involves the following steps:

a. The waste sulphite liquor, which is acid, is aerated to remove sulphur dioxide and then neutralized with lime to reduce the acidity to such a degree that the liquor is rendered suitable for fermentation.

b. The liquor is now pumped to fermentors where nutritive salts and yeast are added and the fermentation then allowed to take effect.

c. The fermented liquor, or wort, next is run through centrifugal separators for the purpose of removing the yeast. The residue, or clear wort, containing approximately 1 per cent alcohol is distilled and the alcohol removed from the fractional distilling column.

d. The yeast in the separators is reused in the next fermentation of the operating cycle.

The final stage mentioned above is the process of Les Usines de Melle under whose patents the Ontario company is licensed. The basis of this process is that when yeast is present in a suitable medium containing sugar, the contents of the resulting fermentation tends to divide into two stages. In the first stage the yeast cells multiply using sugar for food until there are enough yeast cells present so that they are crowded. At this same time, there is a maximum growth of yeast and a minimum production of alcohol. In the second stage the yeast reduces its rate of budding, or division, and continues to feed on the remaining sugar which is present. During this stage there is a minimum growth of yeast and maximum production of alcohol. The idea or principle of re-using the yeast is to establish at once in each new fermentation the crowd of yeast cells that was present at the end of the previous fermentation. In this way the fermentation is confined to the second stage and the alcohol yield therefore improved.

In the design, installation and operation of the Thorold plant, the Ontario Paper Company obtained the assistance of Dr. M. M. Rosten as consultant. Dr. Rosten has had extensive experience with alcohol production in Europe, including close association with Les Usines de Melle and their processes. For many years he has been a strong advocate of alcohol production from waste products of vegetable origin, including both waste sulphite liquor and agricultural wastes. Engineering and construction was done by the Ontario Paper Co. organization, and the alcohol plant is expected to continue utilizing the facilities of the whole organization for management, engineering, maintenance, control, accounting, research and development.

War Cost U. S. $7,373,000,000 in May

War expenditures by the United States Government during the month of May amounted to $7,373,000,000 showing only one percent increase over April expenditures of $7,290,000,000. The daily rate of war expenditures averaged $283,600,000 in May compared to $280,400,000 in April.

On a monthly or daily rate basis, war expenditures in May 1943 were 18 percent higher than in January 1943; 93 percent higher than in May 1942, and 675 percent higher than in May 1941.

Expenditures for war purposes by the United States Government from July 1940, through May 1943, amounted to $102,322,000,000.

AIR SERVICE STARTS from LOUISIANA to PANAMA

By

WILLIAM VAN DUSEN
Pan American Airways System

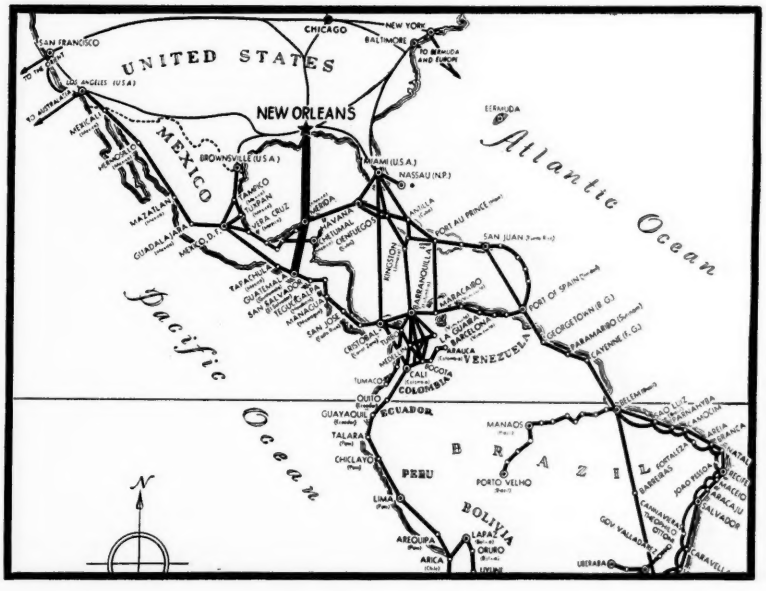
UP betimes one morning last month, Sam Houston Jones, Governor of Louisiana, and a host of other officials journeyed to the New Orleans Airport to watch an airplane take off.

It was no ordinary flight they were to witness but one of special significance to the city, state and nation — in fact to the entire twenty-one American Republics. Nor was it an ordinary plane. The great Pan American Stratoclipper Comet on the runway was more than twice the size of any other type of commercial land transport plane in use today. Into its luxurious cabin stepped fourteen passengers, including Juan T. Trippe, president of the Pan American World Airways System, and the Clipper soared off into the velvet night.

Thus at 1:50 a.m. (Central War Time) on June 13, 1943, did Pan American Airways inaugurate new international air transport service between New Orleans and the Canal Zone. That flight established New Orleans as the deep central South's first international air gateway between the Americas, a gateway to serve the 57,000,000 residents of the nineteen states in the great Mississippi and Ohio river valleys. Through Pan American's vast air network and affiliated lines it meant direct links

(*Continued on page* 56)

Above—The new Pan American Stratoclipper Comet and below is shown its route and connections with other Central and South American routes.



Fluorescent Lighting Maintenance

By

JOHN J. NEIDHART

John J. Neidhart, Engineer, Lighting Division Westinghouse Electric and Manufacturing Company, Cleveland, Ohio

MAXIMUM efficiency without sacrifice of quality has always been a goal and byword of American industry. In the past, peak efficiency has meant only greater profits and improved consumer goods at lower prices. Today, however, efficiency has taken on a new and much more important meaning, for the more quickly and efficiently our plants produce the vital material needed to supply our fighting forces, the sooner we will achieve our goal—Victory.

If we examine the different ways that productive efficiency may be increased, we soon learn that high levels of proper quality illumination enable workers to produce more goods with less effort. Although it is essential that the lighting installation be carefully designed to obtain the best results, we shall not discuss the design of the lighting system but how we may obtain optimum operating efficiency of any lighting installation.

The efficiency of any given lighting installation is dependent upon two things: (1) the painting of all surrounding surfaces which might absorb some of the light, and (2) the maintenance of the lighting equipment.

Painting

High reflection factor, matte or semi-matte surfaces, are essential for maximum utilization and diffusion of the light. Ceilings, walls, trusses, columns and machinery may absorb a considerable percentage of the light if their surfaces are not painted a light color; causing most of the light striking the surface to be reflected, increasing the amount of light reaching the working plane. Selection of the paint to be used should be governed by the following requisites:

Reflectivity — High reflection factors lead to high efficiencies, and it is therefore, desirable to paint all ceilings, walls, trusses and columns with a paint having a reflectivity of 75 per cent or better except for a darker wainscot below the working plane. Although it is not possible to maintain this high reflection factor for an extended period of time in factory areas having a dirty or oily atmosphere, it can always be restored to its initial value by repainting or by washing.

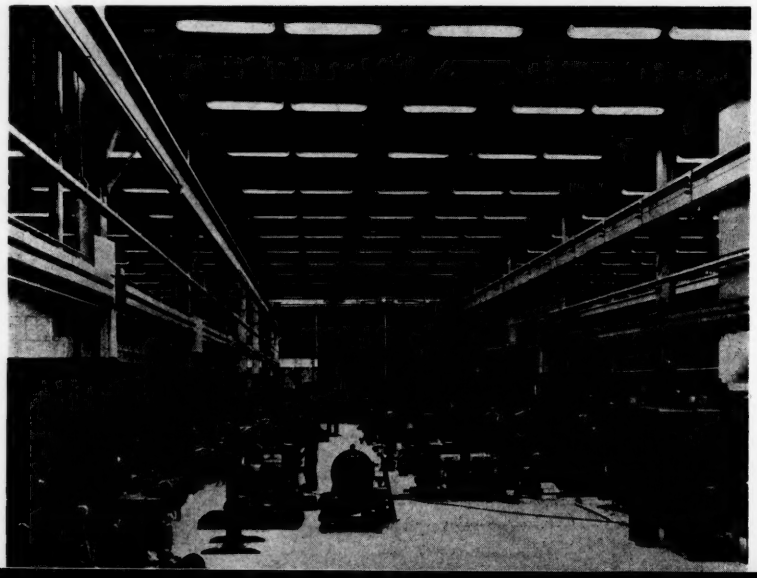
Finish—Glossy finishes should be avoided, for the resulting specular reflections of the light sources will cause annoying glare. A matte finish is most desirable in clean areas since it will provide for greatest diffusion of the light and will completely eliminate specular reflections. A semi-matte or egg shell finish is usually more satisfactory, since it has a smoother surface which does not collect dirt as easily as does the relatively rough surface of a matte finish.

Durability—In every factory, the reflectivity and appearance of the paint may eventually be impaired by dust and dirt collection. It is, therefore, advisable to select a paint which is moisture resistant and levels out to a smooth continuous film which is resistant to soiling and may be washed frequently with soap and water. If the painted surfaces are exposed to vapors and gases, special fume and moisture-resisting paint should be employed.

Color—In general, all surfaces except the machinery should be painted white since white has a higher reflectivity than any color and helps create a bright, cheerful atmosphere. White paints are often tinted slightly with blues or yellows, but tests have indicated that the natural or warm whites depreciate less with age than do the blued whites. Slightly blued whites are often the most desirable, however, when used with incandescent of 3500° white fluorescent lamps since the blue tint will tend to be color-corrective and provide a more balanced, non-chromatic white light. The machinery may be painted a medium grey, but tests have shown that visibility and safety may be enhanced by painting the working area of the machine a lighter, contrasting color such as buff or cream.

Advantages of Proper Painting

High reflection factor surfaces will increase illumination and also provide for better diffusion of the light, minimize shadows, reduce harsh shadows between the light sources and the surroundings, improve seeing comfort and prevent the illumination from dropping off near the walls or around large col-



Visibility and lighting efficiency are greatly enhanced by the white ceiling and columns in the machine shop shown here.

umns.

A worker should never be forced to look up into dark surroundings when he raises his eyes from his work, for it will have a detrimental effect upon his eyes and lead to defective eyesight. When a person shifts his eyes from a bright area to a dark one, his eyes must readapt themselves to the different intensity. Since a worker looks up rather frequently to rest his eyes by allowing them to focus on a more distant object, it is important that he look up into light surroundings.

Scientific research has shown, for example, that 12 per cent less work was done when the eyes alternated between two brightnesses, one of which was 100 times greater than the other, than when the brightness was uniform.

Before-and-after checks on the illumination in various factories have proved that the illumination may be increased 100 per cent or more by proper painting alone. For example, an Ohio manufacturer found that the illumination in his factory was increased from 5 footcandles to 15 footcandles by merely repainting all interior surfaces to prevent light absorption. Benefits resulting from such an increase in illumination become even more significant when one considers that it does not include the more intangible benefits of better diffusion and improved seeing comfort.

Maintenance

Maintenance departments of all factories should devote special attention to the care of lighting installations. Planned maintenance will assure peak efficiency and prolong the useful life of the lighting equipment. The best 50-foot candle installation is no better than a comparable 20-foot candle installation if burned out lamps are not replaced and the reflectors are not kept clean, reducing illumination to a fraction of its designed *maintained* value.

A well-planned maintenance program divides itself into two phases: (1) the *cleaning* of the lighting equipment and reflecting surfaces to remove dust and dirt, and (2) the *relamping* of the luminaires immediately after lamp burnouts or on a systematic lamp replacement plan.

Cleaning—The permissible time between cleanings is peculiar to each installation since the rate of decrease in light output varies with the type of lighting equipment and the amount of dust and dirt in the air. Dust tight covers will simplify the maintenance problem considerably in extremely dirty atmospheres such as are prevalent in foundries. The best method of establishing a cleaning schedule for any installation is to make periodic checks of the illumination with a light meter. The length of time required for the illumination to drop to approximately two-thirds of its initial value may be arbitrarily taken as a satisfactory cleaning period in most cases. This period may be as short as 3 or 4 weeks in extremely dirty locations, but it will usually be from 2 to 6 months under average conditions.

When luminaires are cleaned, all reflecting surfaces and glass covers should be thoroughly washed with soap and warm water. Merely wiping off the reflector or glass with a dry cloth is not only insufficient but is also apt to shorten the life of the reflector. Greasy dirt and grime which remains after several dry wipings will tend to form a permanent coating which cannot be removed.

Relamping—Rated life of a lamp is the average life of a large number of lamps and is not indicative of the life of any one lamp. Many lamps will have a much shorter life than the rated hours, but an equal number will burn longer than the rated hours. The lamps will, therefore, burn out at specific intervals with the maximum number of burnouts occurring at or near multiples of the rated life. Burned out lamps may either be replaced as burnouts occur or on a group replacement plan. The group replacement plan has the advantage that it may be combined with the cleaning program by arranging the cleaning schedule so that the lamps are approaching the end of life at some even multiple of the period between cleanings.

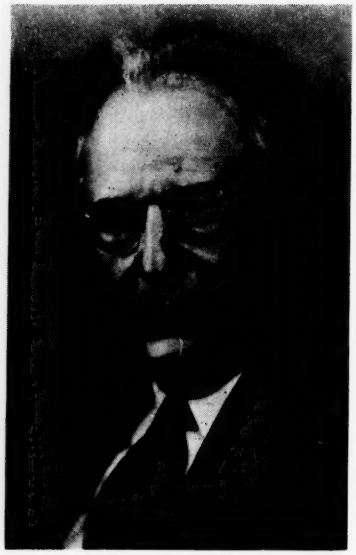
At that particular cleaning, which may be somewhere between 80 per cent and 90 per cent of normal lamp life, the entire installation is relamped and the system is restored to practically its initial efficiency. The old blackened lamps which are close to the end of life may be discarded, but those showing signs of further useful life are set aside to replace the few early burnouts which will occur in

(*Continued on page 54*)

Proper maintenance of fluorescent and other lighting fixtures should include regular a cleaning schedule. At top—Washing the reflector with soap and water is essential—a moist cloth is not enough. Center—removing the reflector. Bottom—Easily removable reflectors speed the work of cleaning.

NEW USE FOR COTTONSEED OIL

A Substitute for Imported Palm Oil in Making Tin Plate



By
W. W. SKINNER
Chief, Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, United States Department of Agriculture

ONE of the jobs that confronted scientists at the beginning of the present war was to find satisfactory substitutes for essential goods .normally imported. That task has not been completed yet. There are still many unsolved problems in connection with that endeavor, but we are making progress and each day brings us a little nearer to our goals.

Japanese conquests in the Pacific shut off annual imports of something like two billion pounds of coconut and palm oils. These are two of the most important vegetable oils that are imported into the United States, and it was up to the chemists to find satisfactory substitutes.

Palm oil has been used in making shortening, oleomargarine, and soap, in the manufacture of tin and terne plate, and more recently in the production of sheet steel by the cold reduction process. Its use in food products has been decreasing in recent years, and its use in certain types of soaps, while desirable, is not essential. But its use in the tin and terne plate industry has been considered indispensable, and until recently the belief was rather widespread that no other oil could take its place in that field. Palm oil was thought to be so essential to the tin plate industry that the War Production Board restricted its use in 1942 to the manufacture of tin plate, terne plate, steel sheets, steel strips, black plate, and so on. The change in recent years from hot reduction to cold reduction processes for the production of sheet steel has increased the demand for palm oil until more palm oil is probably being used in the production of sheet steel than in making tin and terne plate.

Palm oil is used in the last tank of a tinning machine, as shown in Figure 1, to keep the tin coating in a soft molten stage while the metal sheet that is being coated with tin is passing through the rolls. It helps also to protect the tin from oxidation or discoloration while it is cooling. In the cold reduction process palm oil, especially spent palm oil from the tin bath, is one of the oils used as an external lubricant for the rolls which work under such terrific pressure that they would actually melt the metal that is being rolled if they were not kept constantly lubricated on the outside and cooled by circulating water on the inside.

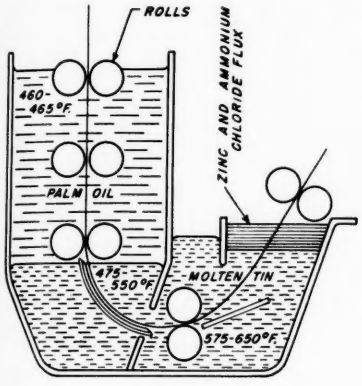
Nobody seems to know exactly just why palm oil has come to be looked upon as the only oil that could be used in the tin and terne plate work. In the early days the Wales tin plate industry needed an oil to blanket its tin pots, and the British Empire had at its disposal ample supplies of palm oil, a raw material that met the need and which has been used for that purpose ever since. There has been some research looking toward the development of a substitute for palm oil. Agricultural chemists conducted investigations in World War I when it appeared that our supplies of palm oil might be cut off. Other investigations have been made from time to time, but until recently nothing was developed that would satisfactorily take the place of palm oil in the production of tin plate.

By the summer of 1941 the darkening war clouds indicated the possibility of reductions or complete elimination of our imports of palm oil, and plans were started to meet such an emergency. The Bureau of Agricultural and Industrial Chemistry's Southern Regional Research Laboratory at New Orleans was directed to start work on the development of a substitute for palm oil which could be made from domestically available raw materials.

One of the first things the chemists did was to try to find out why palm oil is so satisfactory in the tinning industry. But the literature was conflicting, so the cooperation of a number of tin plate producers and consumers was sought. They were asked to compile and supply us with information on the properties and behavior of palm oil in the tin bath, and if possible to give us some of the reasons for its use in preference to other oils. The response to this request was most generous. It was apparent from the information obtained that the chemical and physical bases for the behavior of palm oil in the tin bath have not been known with certainty, and that palm oil is not the ideal oil for that purpose but is used largely because it is the cheapest and among the best of the oils available.

With this information the chemists set out to produce what might be called a "tailor made" oil for the tin plate industry. Dr. K. S. Markley and his associates work-

ing on the problem in the Southern Laboratory, directed their efforts toward the development of an oil that would be better adapted to the tinning operation, bearing in mind that it would have to be produced from domestically available raw materials, and that it would have to compete in price with imported palm oil if it was to be used in large quantities after the war and



Tinning apparatus

the resumption of normal world transportation.

In normal times the South produces large amounts of cottonseed oil, so the scientists turned to this as the source of their raw material. Collins and Clark, two Department of Agriculture chemists, tried hydrogenated cottonseed oil as a substitute for palm oil in the tin bath during World War I when the producers of tin plate were faced with the possibility of a shortage of palm oil. Hydrogenated cottonseed oil is a little harder than palm oil, and in tests it gave somewhat better performance in the tin bath than palm oil, but it didn't replace palm oil largely because it was more expensive and because the war ended before our supplies of imported palm oil were exhausted.

Ordinary refined cottonseed oil cannot be used because it is too unstable for the high temperatures of between 400 and 650 degrees Fahrenheit that prevail in the tin pots. It was found that the more highly hydrogenated cottonseed oils were unsatisfactory in the tin bath because they failed to remove the oxide coating from the tin. In view of these results it was decided to try a semi or medium hard hydrogenated cottonseed oil, one hydrogenated to the approximate degree found in natural palm oil. Tests showed that hydrogenated cottonseed oil of 55 iodine value or less was as good as palm oil in its ability to withstand prolonged heating such as it would get in the tin pots and to dissolve the tin oxide and permit its removal as the sheet passed through the final rolls.

By this time the scientists felt that they were definitely on the right road and that they should now concentrate on strengthening the things that would make hydrogenated cottonseed oil as good or better than palm oil for tinning operations. The lower iodine numbers mean harder and therefore more stable oil, but hydrogenated cottonseed oil with the low iodine number values had a tendency to "freeze" in the circulating lines of the machinery. It was found that iodine number values of around 48 to 50 gave good results in the Northern part of the United States while numbers as low as 40 could be used in the South, so an iodine number of 50 was selected as being about the best.

On the basis of the investigations reported and others too technical to present in a short article, the scientists prepared several types of hydrogenated cottonseed oil and submitted them to interested tin plate producers for commercial-scale testing. These were so satisfactory that general specifications for the production of the oils have been drawn up and placed in the hands of oil mills interested in producing the palm oil substitute from cottonseed oil.

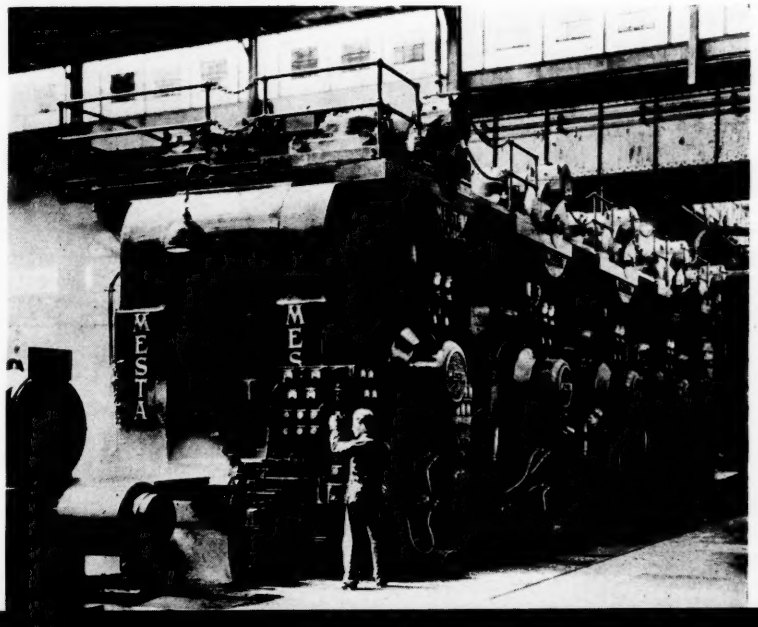
The price of this substitute appears to be reasonable. It costs about twice as much as palm oil, but in actual use it lasts three times as long so that in the end it is cheaper than palm oil.

Whether or not the tin plate industry accepts the new substitute on a large scale depends, in my opinion, on two things, the length of time that the supply of palm oil stored in this country can be made to last, and industry's reluctance in changing from an old to a new process of manufacture.

We use in this country around 40 million pounds of palm oil annually in the production of tin and terne plate and in the cold reduction process of making sheet steel. Under normal conditions, our factory and warehouse stocks of palm oil amounted to around 150 million pounds. It is all imported and formerly came largely from Dutch possessions in the East Indies. All imports have been cut off, and our stocks are being used up at the rate of about 5 million pounds a month. At the present rate of consumption the supply of palm oil in this country will last about a year if it is all allocated to the production of tin plate and the cold rolling of steel.

It is a comforting thought to know that we can turn to the new hydrogenated cottonseed oil as a substitute when our supply is exhausted, or sooner if we wish to do so. Research solved the problem.

Mill used in making sheet steel by the cold reduction process. Note vaporization of palm oil as the sheet emerges from the rolls.



South's Construction Contracts Gain in June

Industrial contracts more than double May total

By

S. A. LAUVER
News Editor

SOUTHERN construction gained during June.

The $159,804,000 for awards made below the Mason and Dixon line was a ten per cent rise over the figure for the preceding month. Compared with the sixth month of last year, however, the current June total showed a drop, most of which was due to the decline in governmental construction, one of the two fields where most of the activity has occurred in recent months.

Industrial contracts in June mounted to more than twice the $24,489,000 for May. The $54,812,000 total was about one third of the value of awards made in the comparable month of 1942. The $47,475,000 valuation placed on public building awards in the South and the $33,081,000 for public engineering construction both represented losses from the figures for May this year and for June of 1942.

Current private building awards totaling $8,401,000 are stronger than they have been since last June, when the total was $14,354,000. Highway and bridge contracts also showed strength in June, the $16,035,000 figure comparing favorably with the $20,487,000 of June last year and far surpassing the $10,362,000 of May.

Trends in Southern construction, as in other parts of the country, have been downward when compared with the high levels of the boom years of 1941 and 1942. The six-month total so far for 1943 is $868,781,000, a figure much below those for the first six months of the two preceding years, but which is more than twice the $413,721,000 for the first six months of 1940, a more normal year and the first when Southern construction passed the billion dollar mark for a twelve-month period.

Industry is already thinking of the post war period. Harbingers of what is to come may be indicated by reports that several companies —one a tobacco manufacturer and the other a yacht builder—are considering construction of large plants as soon as hostilities cease and the utensils of war no longer require the bulk of the country's productive capacity.

The tobacco manufacturer is Block Brothers Tobacco Co., of Wheeling, W. Va. It is the intention to replace the present factory with a new one to cost in the neighborhood of a million dollars. The yacht company has publicly proclaimed its plan in an advertisement which said that one of three postwar objectives was to build a modern waterside plant in which to resume and expand production of peacetime boats.

Meanwhile, the War Production Board has announced that inquiries from prospective applicants for permission to construct industrial facilities have multiplied within the last few weeks. The queries have been directed to the Board's construction advisory service, an expansion of a previously established bureau to advise manufacturers and builders on the basis of preliminary drawings and plans before formal pleas are made.

"Due to the general curtailment in facilities construction," the Board said, "companies desiring new facilities have been seeking information as to what considerations now govern the granting of authority to begin construction and obtain appropriate priorities." Applicants or their architects and engineers may avail themselves of the service, which is organized to advise owners and builders on currently permissible types of construction and materials.

Municipalities, as if in answer to recent allegations that little action was being taken on a post-war construction program to alleviate

South's Construction by States

	June, 1943		Contracts Awarded First Six Months 1943	Contracts Awarded First Six Months 1942
	Contracts Awarded	Contracts to be Awarded		
Alabama	$3,468,000	$22,520,000	$25,991,000	$89,325,000
Arkansas	988,000	1,782,000	26,471,000	36,775,000
Dist. of Col.	2,184,000	616,000	10,313,000	39,224,000
Florida	15,964,000	12,460,000	109,037,000	159,775,000
Georgia	7,042,000	12,659,000	57,561,000	100,878,000
Kentucky	4,251,000	4,565,000	21,875,000	85,135,000
Louisiana	17,804,000	7,609,000	39,778,000	140,805,000
Maryland	6,339,000	3,984,000	61,118,000	129,080,000
Mississippi	5,212,000	2,457,000	25,675,000	125,557,000
Missouri	1,923,000	1,365,000	14,290,000	44,128,000
N. Carolina	9,528,000	4,249,000	31,684,000	133,611,000
Oklahoma	25,894,000	9,893,000	70,558,000	126,685,000
S. Carolina	6,938,000	5,455,000	31,480,000	47,397,000
Tennessee	27,730,000	5,304,000	64,284,000	131,545,000
Texas	20,628,000	21,921,000	222,411,000	682,218,000
Virginia	3,246,000	10,195,000	48,769,000	208,295,000
W. Virginia	665,000	2,444,000	7,486,000	31,747,000
TOTAL	$159,804,000	$129,478,000	$868,781,000	$2,312,180,000

the unemployment which most authorities believe will follow the current conflict, are also taking the initiative toward projects to provide such work. One of these, in but the recommendation stage, involves a $26,500,000 outlay for enclosing the entire length of the River des Peres at St. Louis. Object is prevention of floods.

A proposal at Houston, Texas, would involve construction of several $5,000,000 tunnels as part of a $50,000 highway development plan for that city and ten adjacent counties. At Chattanooga, Tenn., a flood prevention program would involve expenditure of $13,500,000. Another tunnel has been recommended to connect Norfolk and Portsmouth, in Virginia. This also is planned as a post war project.

The Home Use program of the National Housing Agency is moving along at an accelerated pace. Main objective of the program is to influence property owners to convert available buildings into living quarters for war workers. There are 155 war housing centers in key war industry centers where the idea is being pressed. The South is sharing importantly in the work.

More than 21,000 additional family dwelling units will be made available upon completion of the structures now being converted, with the figure moving upward daily as additional projects are initiated. Two-story dwellings are the principal type of structure being submitted by owners for conversion.

Unused priorities, which have been reported as tying up critical materials available for war housing, have been recalled by the War Production Board with the view to reallocating the materials among builders who are prepared to go ahead with construction. The order is intended to recover priorities from builders not in a position to produce the needed housing and place those priorities in the hands of builders who can qualify.

Post-war unemployment is still the subject of many debates, but there does seem to be agreement on the point that there will be unemployment. Frank W. Herring, assistant director of the National Resources Planning Board, believes that "the seriousness of the employment question will not be any less than it was in 1933." Responsibility for providing the jobs, he points out, is not a government monopoly.

Facilities produced by public construction will be needed, whether there is an unemployment situation or not, he says, but "post-war public construction programs cannot be brought into existence by touching a button or waving a wand. Authorizations must be obtained, engineering plans and designs and specifications must be prepared and sites acquired, all before one shovel of earth can be turned in actual construction operations."

South's Construction by Types

	June, 1943 Contracts Awarded	June, 1943 Contracts to be Awarded	Contracts Awarded First Six Months 1943	Contracts Awarded First Six Months 1942
PRIVATE BUILDING				
Assembly (Churches, Theatres, Auditoriums, Fraternal)	$145,000	$799,000	$772,000	$3,358,000
Commercial (Stores, Restaurants, Filling Stations, Garages)	30,000	75,000	479,000	3,943,000
Residential (Apartments, Hotels, Dwellings)	8,226,000	2,098,000	29,246,000	81,024,000
Office	.....	85,000	20,000	997,000
	$8,401,000	$3,057,000	$30,517,000	$89,322,000
INDUSTRIAL	$54,812,000	$31,412,000	$186,955,000	$716,333,000
PUBLIC BUILDING				
City, County, State, Federal	$35,026,000	$41,623,000	$265,873,000	$943,532,000
Housing	10,497,000	13,539,000	124,711,000	136,235,000
Schools	1,952,000	3,661,000	8,796,000	21,545,000
	$47,475,000	$58,823,000	$399,380,000	$1,101,312,000
ENGINEERING				
Dams, Drainage, Earthwork, Airports	$29,468,000	$24,514,000	$160,930,000	$258,220,000
Federal, County, Municipal Electric	120,000	260,000	3,822,000	12,428,000
Sewers and Waterworks	3,493,000	2,978,000	21,690,000	42,556,000
	$33,081,000	$27,752,000	$186,442,000	$313,204,000
ROADS, STREETS AND BRIDGES	$16,035,000	$8,434,000	$65,487,000	$92,009,000
TOTAL	$159,804,000	$129,478,000	$868,781,000	$2,312,180,000

Industrial

(Including Private Utilities)

	June, 1943 Contracts Awarded	June, 1943 Contracts to be Awarded	Contracts Awarded First Six Months 1943
Alabama	$35,000	$20,085,000	$3,560,000
Arkansas	550,000	100,000	4,640,000
Dist. of Col.	.....	.....	3,750,000
Florida	320,000	1,135,000	4,950,000
Georgia	365,000	97,000	2,014,000
Kentucky	850,000	2,000,000	9,772,000
Louisiana	11,050,000	75,000	13,892,000
Maryland	314,000	50,000	4,605,000
Mississippi	83,000	.....	424,000
Missouri	398,000	115,000	5,228,000
N. Carolina	1,724,000	358,000	3,979,000
Oklahoma	15,000,000	3,500,000	30,550,000
S. Carolina	2,650,000	.....	3,029,000
Tennessee	20,000,000	63,000	21,547,000
Texas	1,420,000	3,682,000	72,303,000
Virginia	18,000	67,000	2,542,000
W. Virginia	35,000	85,000	170,000
TOTAL	$54,812,000	$31,412,000	$186,955,000

Public Engineering

(Dams, Drainage, Sewers, Waterworks, etc.)

	June, 1943 Contracts Awarded	June, 1943 Contracts to be Awarded	Contracts Awarded First Six Months 1943
Alabama	$.....	$50,000	$3,568,000
Arkansas	100,000	1,025,000	7,048,000
Dist. of Col.	188,000	15,000	539,000
Florida	6,018,000	3,927,000	40,275,000
Georgia	2,534,000	2,405,000	8,604,000
Kentucky	50,000	95,000	3,068,000
Louisiana	4,848,000	2,153,000	11,627,000
Maryland	407,000	30,000	23,128,000
Mississippi	1,741,000	1,205,000	6,364,000
Missouri	100,000	170,000	938,000
N. Carolina	2,909,000	1,752,000	5,818,000
Oklahoma	4,873,000	2,230,000	23,912,000
S. Carolina	1,675,000	1,415,000	5,598,000
Tennessee	1,564,000	4,150,000	5,525,000
Texas	5,865,000	4,819,000	39,235,000
Virginia	209,000	1,411,000	1,145,000
W. Virginia	.....	900,000	50,000
TOTAL	$33,081,000	$27,752,000	$186,442,000

Public Building

(City, County, Federal; Housing; Schools)

	June, 1943 Contracts Awarded	June, 1943 Contracts to be Awarded	Contracts Awarded First Six Months 1943
Alabama	$3,098,000	$2,200,000	$15,726,000
Arkansas	278,000	200,000	12,144,000
Dist. of Col.	1,456,000	266,000	3,749,000
Florida	5,395,000	5,818,000	46,504,000
Georgia	3,262,000	9,917,000	43,512,000
Kentucky	2,228,000	2,020,000	5,020,000
Louisiana	822,000	3,938,000	8,389,000
Maryland	1,126,000	3,346,000	18,899,000
Mississippi	2,596,000	1,202,000	17,215,000
Missouri	581,000	720,000	6,132,000
N. Carolina	3,490,000	2,019,000	19,038,000
Oklahoma	4,629,000	3,271,000	9,330,000
S. Carolina	2,578,000	3,725,000	21,931,000
Tennessee	4,452,000	1,041,000	33,359,000
Texas	9,252,000	10,546,000	90,531,000
Virginia	2,170,000	8,535,000	41,934,000
W. Virginia	62,000	59,000	5,967,000
TOTAL	$47,475,000	$58,823,000	$399,380,000

Private Building

(Assembly, Commercial, Residential, Office)

	June, 1943 Contracts Awarded	June, 1943 Contracts to be Awarded	Contracts Awarded First Six Months 1943
Alabama	$250,000	.....	$250,000
Arkansas	.....	.....	1,860,000
Dist. of Col.	89,000	.....	1,167,000
Florida	356,000	225,000	869,000
Georgia	376,000	90,000	550,000
Kentucky	.....	.....	.....
Louisiana	399,000	675,000	941,000
Maryland	3,778,000	443,000	9,708,000
Mississippi	300,000	.....	858,000
Missouri	75,000	50,000	340,000
N. Carolina	40,000	20,000	217,000
Oklahoma	.....	147,000	2,635,000
S. Carolina	.....	315,000	429,000
Tennessee	10,000	.....	272,000
Texas	2,333,000	1,060,000	9,317,000
Virginia	395,000	32,000	1,004,000
W. Virginia	.....	.....	100,000
TOTAL	$8,401,000	$3,057,000	$30,517,000

CHEMICAL FERTILIZERS IN WARTIME

By

CHARLES J. BRAND

Executive Secretary and Treasurer The National Fertilizer Association, Washington, D. C.

PRODUCTION is the keynote of modern war. Manpower in uniform is of relatively little importance unless there is sufficient production capacity behind it to furnish all the ships, the planes, the guns, the ammunition, and the food the men need. An army is just as dependent on food today as it was in Napoleon's time. In addition, present-day morals prescribe that the civilian populations of captured enemy territories or of allied countries released from enemy occupation must be fed until their own facilities for food production are restored.

A tremendous responsibility has been placed on our farmers. With greatly diminished manpower, with severe restrictions on the production of farm machinery, with scarcity of many seeds, with certain plantfood materials taken for munitions or assigned under priorities to allied countries, our farmers must produce to the maximum. They are expected to supply the food necessary to keep our armed forces in fighting trim, the food necessary to keep our production army at top efficiency, the food for the rest of our civilian population, and, in addition, a tremendous quantity of food for our allies.

Commercial plantfood in the form of manufactured fertilizers is a most important factor in food production. Careful estimates develop that approximately 20 per cent of our total agricultural production is the direct result of the use of commercial fertilizers. The only substitute for them would be to put about 30,000,000 additional acres of land in cultivation. This would be in addition to 47,000,000 acres suggested by former President Hoover or 25,000,000 acres suggested by former Food Administrator Davis to meet feared shortages.

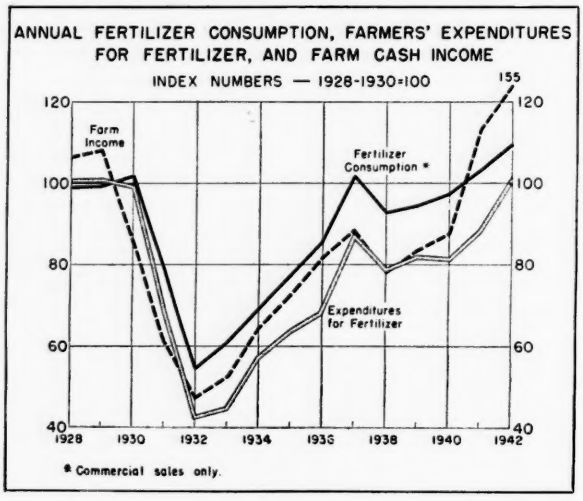
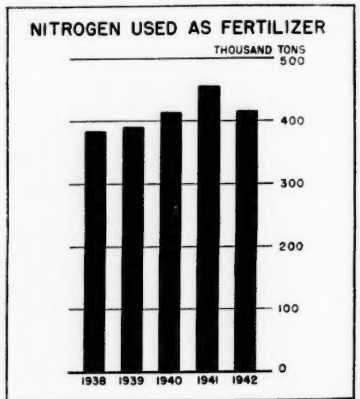


Figure I

In 1929 and again in 1939 we made consumer surveys in which 48,000 farmers in 1929 and 32,000 farmers in 1939 were interviewed personally. As an average of their reports, we found that in each of those years approximately $3.60 was returned to the farmer in crop value for each $1.00 that he spent for fertilizers. These figures were based on the prices prevailing in those years. Fertilizer prices now are about 116 per cent of the prices prevailing in the 1910-1914 period. The comparative index number of prices of all commodities now is 152, and the comparative price now received by the farmer for what he sells, is 186. Based on present fertilizer prices and the present prices for farm crops, between $5.00 and $6.00 is returned to the farmer in crop value for each $1.00 he spends on fertilizer. (See Figure I).

The fertilizer industry under various conservation and limitation orders of the War Production Board, the Office of Price Administration, the Office of Defense Transportation, the War Manpower Commission, and the War Food Administration. The WFA, through FPO 5, directs what grades of fertilizer may be sold in each State, on what crops fertilizer may be used, and the amount of fertilizer that may be used on each acre of crop.



YEAR	TONS OF NITROGEN
1938	384,000
1939	390,000
1940	413,000
1941	456,000
1942	415,000

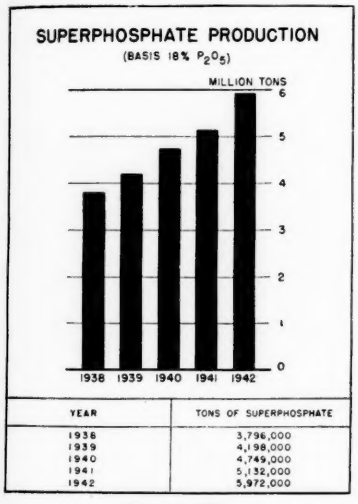
Figure II

There was a definite shortage of chemical nitrogen for agriculture for the fiscal year ending June 30, 1943. Chemical nitrogen for the

production of explosives properly took precedence. With the help of the War Shipping Administration, over 1,000,000 tons of nitrate of soda were imported from Chile to supplement our domestic production of chemical nitrogen. A grade substitution plan was inserted in FPO 5 requiring in general that grades of fertilizer should carry for the same crop at least one unit less of nitrogen in 1942-43 than in 1941-42. A unit is one per cent of a ton or 20 pounds.

Consumption of fertilizers in the calendar year 1942, amounted to approximately 10,000,000 tons, the largest use in history. Indications at present point to a consumption of about 11,000,000 tons in 1943 if sufficient materials, labor, and transportation are obtainable.

Last year, supplies of chemical nitrogen were deficient, but the present outlook is much more favorable. Changes in the requirements of chemical nitrogen for explosives have released to agriculture ammonia solutions not available last year. In addition, considerable quantities of ammonium nitrate manufactured in this country and in Canada are being allocated to fertilizer manufacture. This material is not the most desirable form of nitrogen for fertilizer manufacture as it tends to harden in the bags and is decidedly hygroscopic. Every effort is being made to treat the material so as to render it satisfactory for mixing purposes. Progress already made in this direction indicates that the material shipped in the future will be in much more satisfactory condition if used with reasonable promptness to make fertilizer mixtures. (See Figure II).



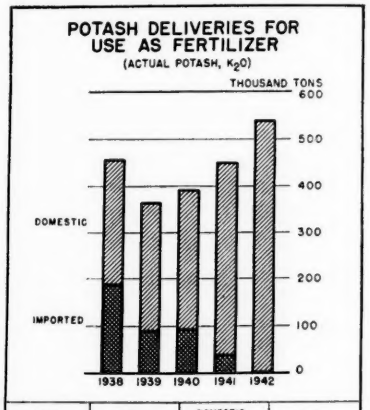
YEAR	TONS OF SUPERPHOSPHATE
1938	3,796,000
1939	4,198,000
1940	4,749,000
1941	5,132,000
1942	5,972,000

Figure III

We shall have about the same production of sulphate of ammonia as last year, and probably about the same amount of cyanamid will be imported as last year. The Fertilizer Industry Advisory Committee has recommended that at least 1,000,000 tons of nitrate of soda be imported from Chile. Assuming that these plans are carried out, we shall have all the chemical nitrogen that really will be needed for the year 1943-44. (See Figure III).

Manufacture of normal superphosphate in 1942 was approximately 5,144,500 tons. Production for the year 1943 is expected to reach 6,500,000 tons and should meet all normal requirements. (See Figure IV).

Figure IV



YEAR	IMPORTED	DOMESTIC PRODUCTION	TOTAL
1938	189,000	270,000	459,000
1939	92,000	273,000	365,000
1940	96,000	297,000	393,000
1941	41,000	410,000	451,000
1942	1,000	539,000	540,000

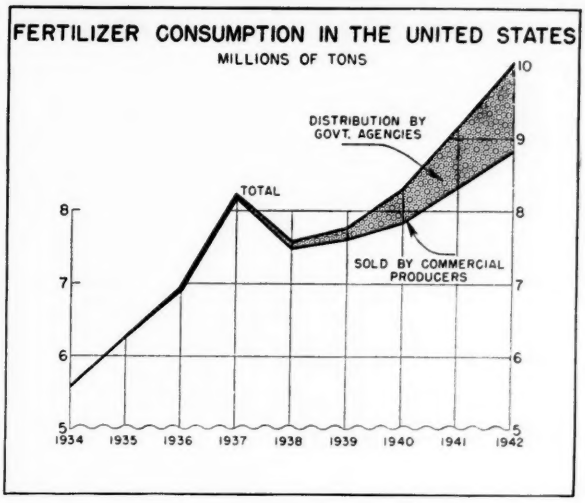


Figure V

Potash production will probably reach an all-time high this year of more than 700,000 short tons expressed as K_2O, but unprecedented requirements for essential chemical use and commitments for Lend-Lease will reduce considerably the amount allocated to agriculture. From 80 to 90 per cent of last year's consumption now seems assured. At present about 540,000 tons are earmarked for farmers.

The increasing competition of Governmental agencies with the commercial fertilizer industry is visualized in Figure V.

It will be noted that in 1938 commercial sales amounted to 7,490,000 tons, and the combined distribution of the Agricultural Adjustment Administration and the Tennessee Valley Authority amounted to but 81,000 tons of which 67,000 tons were distributed by the AAA and 14,000 by TVA. By 1942 commercial sales had increased to 8,749,000 tons while Government distribution had skyrocketed to 1,227,000 tons, 1,195,000 tons of which was distributed by AAA and 31,650 by TVA. Thus in only five years distribution by Governmental agencies has risen from slightly over 1 per cent of the total consumption to over 12 per cent.

For the fiscal year ending June 30, 1944, Governmental plans call for over 1,500,000 tons of fertilizer distribution. This amount is to be

(*Continued on page 53*)

War Contracts and Allocations to Southern States Exceed $22,000,000,000 Through March

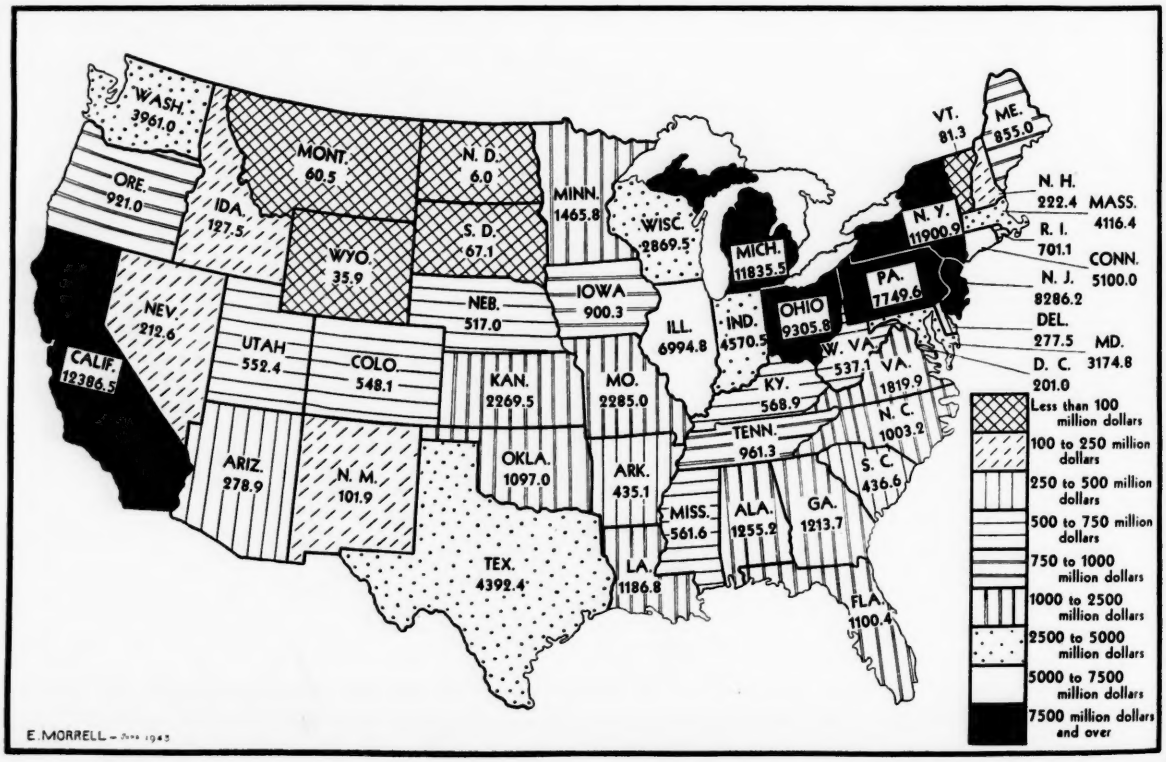
War contracts and allocations distributed by Federal agencies and foreign purchasing missions to the southern states for the period through March, 1943, totaled approximately $22,229,833,000. This represents a gain of $1,003,851,000 during the month of March. United States contracts date only from June 1, 1940, but the foreign contracts started in September, 1939. Included in the United States total of $136,165,824,000 is $14,657,485,000 for contracts executed outside this country and for such contracts as are not yet assigned to a particular state. Awards for the Army, Navy, Maritime Commission, Treasury Department and foreign purchasing missions do not include those having a value of less than $55,000 nor do they include contracts for foodstuffs.

Major War Supply and Facility Contracts and Allocations, June, 1940 Through March, 1943
(Thousands of Dollars)

	Army, Navy and Maritime Commission										
	Supply Contracts			Facilities		Dept. of Commerce C.A.A.	National Housing Agency F.P.H.A.	Federal Works Agency	N.Y.A. and Office of Education	Dept. of Commerce R.F.C.	Total
	Aircraft	Ships	Miscell.	Industrial	Non-Industrial						
Alabama	869	277,105	345,684	384,820	168,006	1,270	40,392	20,491	9,359	7,238	1,255,234
Arkansas	.....	.....	54,090	228,266	121,583	563	20,472	4,715	4,717	687	435,093
Dist. of Col.	70	689	6,841	20,505	54,565	....	55,074	11,417	1,657	50,167	200,985
Florida	1,796	416,068	57,430	56,979	485,739	7,246	27,020	33,961	7,089	7,038	1,100,366
Georgia	344,376	149,093	294,014	101,138	262,446	5,047	32,390	13,334	8,689	3,143	1,213,670
Kentucky	33,422	.....	109,145	212,598	142,988	1,720	8,986	11,590	7,755	40,721	568,925
Louisiana	236,098	213,021	74,047	327,156	257,346	5,827	6,813	16,683	6,827	42,997	1,186,815
Maryland	1,377,867	358,123	906,568	200,689	232,604	....	61,606	15,350	4,704	17,282	3,174,793
Mississippi	712	222,518	68,457	46,409	189,037	1,430	14,619	10,944	7,054	381	561,561
Missouri	448,069	50,312	1,083,704	505,668	150,129	310	16,261	16,545	7,775	6,239	2,285,012
North Carolina	20,029	225,947	335,078	44,507	321,369	587	29,914	17,390	7,688	687	1,003,196
Oklahoma	545,853	.....	93,173	196,687	236,842	1,840	4,244	9,568	8,233	592	1,097,032
South Carolina	.....	25,219	170,843	42,043	139,306	3,674	25,075	25,785	4,420	200	436,565
Tennessee	129,953	15,505	325,648	264,090	198,106	690	8,757	9,448	7,378	1,691	961,266
Texas	1,163,115	996,051	386,820	864,424	825,032	9,710	78,423	43,244	18,896	6,694	4,392,409
Virginia	1,569	695,784	193,357	207,225	538,227	144	141,329	33,099	6,597	2,523	1,819,854
West Virginia	.....	30,479	208,794	264,347	10,853	....	8,029	5,629	8,589	337	537,057
South	4,303,798	3,675,914	4,713,693	3,967,551	4,334,178	40,058	579,404	299,193	127,427	188,617	22,229,833
United States	32,933,925	18,195,031	53,824,483	15,139,822	11,937,156	97,059	1,764,988	737,857	403,923	1,131,580	136,165,824

"Aircraft" includes contracts for airframes; airplane engines, propellers, and other parts; and certain related equipment such as parachutes and aircraft pontoons, armament, instruments, and communication equipment are excluded. "Ships" include contracts for the construction of new vessels of all kinds; the purchase of used ships; and ship conversion, recommissioning, and repair. Propulsion machinery (when separately contracted for), armor, armament, navigation and radio equipment, parts, and materials are excluded.

The total value of war contracts and allocations by all Federal agencies and foreign purchasing missions was $136,165,824,000 for the period September, 1939 through March, 1943. Southern states received $22,229,833,000 of this sum. Each state's share in millions of dollars is shown in the map below.



UNITED STATES TREASURY DEPARTMENT

For distinguished services rendered in behalf of the War Savings Program this citation is awarded to

Manufacturers Record

Given under my hand and seal on **June 9,** *19* **43**

Henry Morgenthau Jr.
SECRETARY OF THE TREASURY

Baltimore 3, Md.

Hon. Henry Morgenthau, Jr.,
Secretary of the Treasury,
Washington, D. C.

Dear Sir:

It is with pleasure and pride that we acknowledge receipt of the award given us for the part that the MANUFACTURERS RECORD has played in assisting the war bond campaign.

Since 1882 the MANUFACTURERS RECORD has printed the thoughts and opinions of its editors. On many occasions its expressions have been critical of persons or policies both economic and political. Freedom of the press is a right guaranteed to all publishers. Every honorable publisher uses this freedom to curb by corrective comment national, state or local conditions that he believes are contrary to the interest of the people as a whole. He is a public servant supported by his readers and pledged to those readers to give them the best of his thoughts.

We are taking the liberty of publishing a copy of this award along with this letter in the MANUFACTURERS RECORD—as we used to say in the Army years ago—"for the information and guidance of all concerned."

Thank you, Mr. Morgenthau.

Sincerely yours,

Wm McSherry

Editor.

SABINE DISTRICT'S ENDURING INDUSTRIAL DEVELOPMENT

By

J. C. WATKINS

Port Arthur,
Chamber of Commerce

THE production of synthetic rubber and high octane gasoline in the Sabine district of southeast Texas is no wartime "flash in the pan" but an enduring industrial development which will well serve the nation's needs in peace.

Thus declared U. S. Rubber Director William M. Jeffers and other notable war production executives after a tour of war plants of Port Neches, Port Arthur, Orange and Beaumont.

Home of the world's largest rubber facility and of America's principal aviation fuel plants, the Sabine district is filling a vital role in the victory endeavor and should go right on supplying tires and gasoline to the country's automobiles and airplanes after the war is won, it was stressed by Jeffers and his colleagues.

Accompanying Jeffers were Undersecretary of Navy James Forrestal, Undersecretary of War Robert Patterson, Deputy Petroleum Administrator Ralph K. Davies, and a large party of aides and assistants.

They viewed with interest the Port Neches rubber development, the Texas and Gulf refineries at Port Arthur and the Magnolia refinery at Beaumont, and the shipyards at Orange—and they were frankly impressed by the teeming wartime activities of this coastal area.

Herbert Henderson of Pittsburgh, Pa., former Port Arthuran who is now vice president of the Gulf Oil corporation and chairman of the board of the Neches Butane Products company at Port Neches, was principal host to the distinguished visitors.

Here are some of the highlight revelations developed during the tour of the district:

—Butadiene production will start at Port Neches in August and the full plant will be in operation before Oct. 1.

—The plant, America's largest, will have a capacity of 100,000 long tons of rubber per year. No other plant in the nation will even approach this figure.

—Available for "essential" driving for the remainder of this year will be 7,000,000 pre-Pearl Harbor tires plus 12,000,000 synthetic tires produced at Port Neches and elsewhere.

—Next year, the Port Neches and other plants will produce sufficient rubber for 30,000,000 tires.

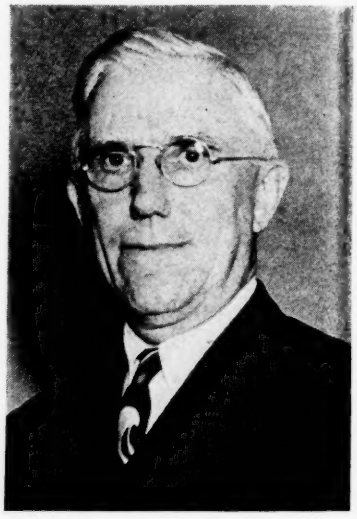
—The American petroleum industry is doing a "remarkable" job in the production of 100-octane gasoline and of ingredients for the manufacture of butadiene.

—The big new pipe lines from the south west to the midwest and east will "prove a boom to Texas and to this section" and can transport gasoline — refined here — as well as crude oil.

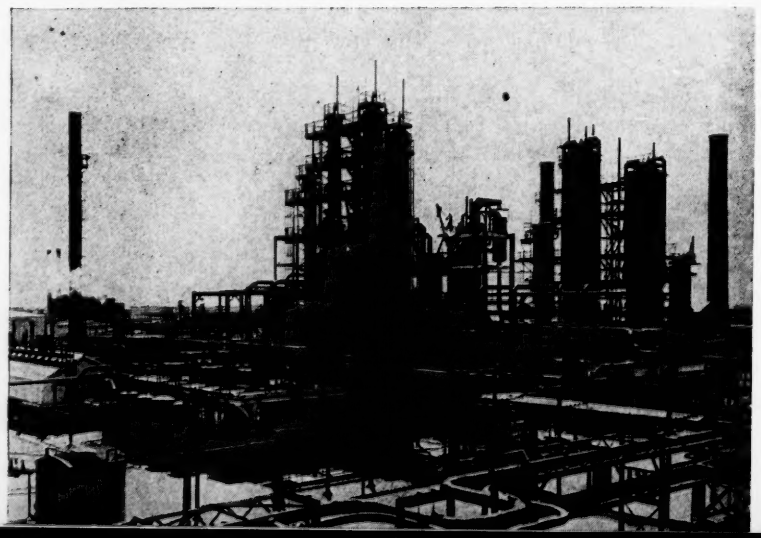
—Refineries of the Port Arthur area by this summer will produce 40,000 barrels of 100-octane gasoline per day, more than the entire national output before the war, use in training personnel of the Neches Butane and Goodyear Tire and Rubber plant, Jeffers said.

Patterson and Davies, the deputy oil administrator, put in the observation that certain phases of the aviation gasoline program still need higher priorities and the latter said he believes these will be forthcoming presently.

(Continued on page 60)



Herbert Henderson, vice president of the Gulf Oil Corp., and a former Port Arthuran, was principal host to the war production executives during their recent inspection of the Sabine district.



Now operating at maximum capacity is this new Gulf Oil Corporation 100-octave gasoline plant recently completed at Port Arthur, Texas. The entire output of this unit is being supplied to the armed forces.

Important New Industrial Plants and Expansions in the South During June

ARKANSAS

Plant facilities—Defense Plant Corporation, Washington, D. C., let contract to Athletic Mining & Smelting Co., Fort Smith, for plant facilities in Arkansas; cost $550,000.

FLORIDA

MIAMI—store warehouse & docks—Shaw Brothers of Florida, Inc., 56 S. W. First Street, Miami,, let contract to Heath & Mann, 3601 N. W. North River Drive, Miami, for the construction of storage warehouse & docks; R. Dec. Weakley, Congress Building, Miami Architect.

GEORGIA

ATLANTA—plant additions—A. K. Adams Co., 542 Plum St., NW., has contract for construction of alterations and additions to Fisher Body Plant on McDonough Blvd., SE., Atlanta, for Firestone Tire & Rubber Co., Arron and Defense Plants Corp., Washington; over $100,000.

TALLAPOOSA — building — American Thread Co., let contract to A. K. Adams Co., 542 Plum St., N.W., Atlanta, for construction of alterations and additions.

Plant facilities—Plantation Co., Vienna, has contract for plant facilities; $120,000.

KENTUCKY

Plant facilities—Defense Plant Corporation, Washington, D. C., let contract to Reynolds Metal Co., Louisville, for plant facilities in Kentucky; cost about $850,000.

LOUISIANA

NEW ORLEANS—alterations and additions—Moise H. Goldstein & Associates, local architects, American Bank Bldg., let contract to Chris Larsen Co., Maritime Bldg., for alterations and additions to the 8-story Industries Bldg., at Saratoga and Gravier Sts.

Plant facilities—Defense Plant Corporation authorized increase of contract with Mathieson Alkali Works, Inc., New York City, to provide additional plant facilities; $11,000,000.

MARYLAND

BALTIMORE—building—Franklin Realty & Finance Co., let contract to Franklin Construction Corp., 207 W. Franklin Street, for addition to building 320 W. 29th Street; brick, steel & frame; 1-story; private plans; $20,000.

BALTIMORE—tank & coal bunker—The Glidden Company, 6401 St. Helena Avenue, let contract to Price Construction Co., Maryland Trust Building, Baltimore, for tile ash tank and reinforced concrete coal bunker; private plans; $10,000.

BALTIMORE — building — Mt. Vernon-Woodberry Mills, Inc., let contract to Cummins Construction Co., 803 Cathedral St., for alterations to mfg. building, 2900-30 Falls Rd.; private plans; $10,000.

BALTIMORE—building — Defense Plant Corp., let contract to General Mechanical Engineering & Contracting Co., 1030 Hillen St., for construction of building, 2800-02 Frederick Ave.; private plans; $40,000.

BALTIMORE — crane — American Brake Shoe Co., let contract to Cummins Construction Corp., 803 Cathedral St., for overhead crane and foundations, concrete retaining wall; $40,000 and $10,000; private plans.

BALTIMORE—laboratory building—The Glidden Co., let contract to The Price Construction Co., Maryland Trust Bldg., for construction of laboratory building, 6401 St. Helena Ave.; private plans; $30,000.

BALTIMORE—plant—Charles T. Brandt, Inc., let contract to George S. Awalt & Co., Morris Bldg., for plant addition, Ridgely & Bush Sts.; Lucius R. White, Jr., 10 W. Chase St., Archt.

Contracts Awarded

MISSOURI

KANSAS CITY—laboratory building—Calvin Co., will erect laboratory building at southwest corner of Twenty-sixth and Jefferson Sts.

ST. LOUIS—plant—Blanton Co., 3400 N. Wharf St., let contract to Alport Construction Co., Ambassador Bldg., for excavation and foundation of Soy Bean Processing Plant, 3400 N. Wharf St.; Gray & Pauley, 3800 W. Pine Blvd., Archt.

ST. LOUIS—machine shop addition—John Ramming Machine Co., 4591 McRee, let contract to Fred Koenig, 3918 Bowen Street, for construction of brick & reinforced addition to machine shop; work started.

Equipment—Defense Plant Corporation, executed contract with Fulton Iron Works, St. Louis, to provide equipment for a plant in Missouri at a cost of $100,000.

NORTH CAROLINA

BURLINGTON—warehouse, etc.—Associated Transport, Inc., Springfield, Mass., let contract to Blythe & Isenhour, Boulevard Court, Charlotte, for warehouse and storage facilities; A. J. Carson, 429 Merrimon Avenue, Springfield, Mass., Architect.

CHADBOURN — dehydration plant — Broadus Wilson, 2514 White Oak Road, Raleigh, has charge of machinery at the dehydration plant in Chadbourn, Columbus County; work has already begun; $50,000.

HIGH POINT — remodeling — E. E. Younts, 206 Thurston St., has contract for remodeling High Point Furniture Plant; expend $9000.

Plant facilities—The Defense Plant Corp., executed contract with Drexel Furniture Co., Morganton, N. C., to provide plant facilities; approximate cost, $175,000.

OKLAHOMA

OKLAHOMA CITY—modification center—U. S. Engineer Office, 416 Wright Building, Tulsa, Okla., let contract to Charles M. Dunning Construction Co., 420½ N. Hudson, Oklahoma City, for construction of buildings on the modification center and to Leo Sanders, Trades National Bank Building, Oklahoma City, for grading and drainage.

TULSA—modification center—U. S. Engineer Office, 416 Wright Building, Tulsa, let contract to Corbetta Construction Co., Inc., New York City, for construction of buildings on the modification center and to Freeto Construction Co., Pittsburg, Kansas, for grading of site.

SOUTH CAROLINA

HOLLY HILL—alumina plant—Defense Plant Corporation, Samuel Husbands, President, Washington, D. C., let contract to Charles E. Daniel Construction Co., Poinsett Hotel Building, Greenville, at $2,750,000, for construction of the alumina plant near Harleyville, in Dorchester County.

ROCK HILL—cold storage—Southeastern Construction Co., 218 W. Second St., Charlotte, N. C., has contract work started on cold storage locker plant, project of Electric Co-Operative Refrigeration Co., brick; 54x71 ft.; cost $32,800 exclusive of equipment; will install 250 individual lockers; W. B. Wilkerson of Hickory Grove, is president of the cooperative.

TENNESSEE

ROANE COUNTY—plant units—J. A. Jones Construction Co., 209 W. Fourth St., Charlotte, N. C., has contract for heavy construction work at Clinton Engineer Works; Foster & Creighton Co., American National Bank Bldg., Nashville, Tenn., has contract for light building construction; contracts total in excess of $20,000,000; U. S. Engineer, Manhattan District, Corps of Engineers, Col. James C. Marshall, in charge; Lt.-Col. Robert C. Blair, Corps of Engineers has been installed as deputy district engineer and works manager at the town site; Lt.-Col. Warren George, Corps of Engineers, project construction manager; Clinton Engineer Works is under construction by War Department in Roane and Anderson counties; when completed will be operated by Tennessee Eastman Corp.; also participating in present plans of development is E. I. du Pont de Nemours & Co.

TEXAS

BEAUMONT—barges — Samuelson Shipbuilding Co., Beaumont, construct 17 all-steel oil barges on Harbor Island opposite city docks; cost $500,000; owner builds.

DALLAS — factory building — national Geophsical Co., 8806 Lemmon Ave., let contract to Cowdin Bros., 411 S. Haskell, for construction of factory building; about $50,000; Walter M. Ahlschlager, 212 S. St. Paul St., Archt.

FORT WORTH—plant addition—Consolidated Vultee Aircraft Co., Fort Worth, let contract to Robert E. McKee, 1918 Texas Street, El Paso, for construction of a two story building, 112,000 sq. ft. floor space for engineering office and storage facilities at bomber plant; $350,000.

FORT WORTH — factory addition — Hyde Corp., 1404 Calhoun, let contract to E. B. Gaby, Lindberg, for construction of one story addition, 105 N. W. 4th Street; 100 by 200; brick, composition roof; concrete floors, etc.; $15,000.

Additional facilities—Defense Plant Corporation, Washington, D. C., let contract to J. S. Abercrombie Co. & Harrison Oil Co. of Houston, for the provision of additional facilities at a plant in Texas at a cost of approximately $1,100,000 resulting in an over-all commitment of approximately $15,500,000.

Equipment—Defense Plant Corporation, Washington, D. C. let contract to Armour & Co., U. S. Yards, Chicago, Ill., to provide equipment for a plant in Texas; cost $235,000.

WEST VIRGINIA

HUNTINGTON — office building — Huntington Precision Products Division, R. S. Ellinwood, Mgr., let contract to Robert Kilgore, for 1-story office building, adjoining main plant, 1444 Washington Ave.; brick; 257x40 ft.; will include hospital wing and other facilities for employees; same contractor has contract for addition in rear of present plant; work under way; office will be constructed of brick, and modeled after Burbank, California, plant of Adel Precision Products Corp. of which the company here is a division.

Contracts Proposed

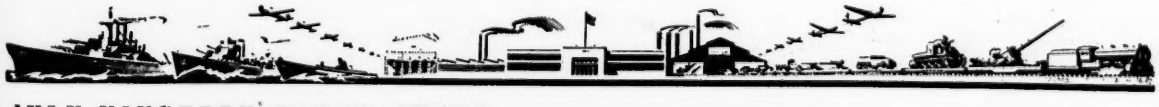
ALABAMA

BESSEMER — trailer plant — Fruehauf Trailer Company, Harry R. Fruehauf, Detroit, Mich., leased three-acre site for trailer assembly plant; has building formerly by U. S. Heater Company, will remodel; plant is located on Eighth Avenue and 25th Street.

DADEVILLE — milk plant — Carnation Milk Co., A. C. Oosterhuis, Auburn, will establish a milk processing plant at Dadeville.

FLORIDA

JACKSONVILLE—plant—Huckins Yacht Corporation, Frank Pembroke Huckins,



President, plans to rebuild a modern waterside plant in which to resume and expand production of peacetime boats as a postwar project.

MIAMI—shed—Miami Shipbuilding Corp., Theo. C. Buhler, President, 615 S. W. 2nd Avenue, was granted permit for construction of 1-story frame construction cleaning shed, 3112 Mundy Street.

ZELLWOOD — dehydration plant — The Florida Dehydration Co. and Zellwood Farms Co., Harry Amenta, vice president and general manager, will undertake $500,000 expansion program; program includes construction of ice plant and pre-cooling plant, canning plant, commissaries, warehouses and filling stations and the development of 6700 additional acres in the projects 18,000- acre muck-tract on Lake Apopka; already under construction is a dehydration plant to replace one destroyed by fire.

GEORGIA

COMMERCE—locker plant—Frozen Food Lockers, Inc., c/o L. G. Hardeman, Jr., Chmn., receives bids July 2, for cold storage locker building; J. B. McCrary Engr. Corp., 1408 22 Marietta St. Bldg., Atlanta, Engr.; following are prospective estimators; Fennell Construction Co., Gainesville; G. S. Wright Construction Co., Athens.

DECATUR—cold storage locker—Frozen Food Locker, c/o Goodloe H. Yancey, 634 Whitehall Street, S. W., Atlanta, plans the construction of a food locker building; J. B. McCrary Engineering Corp., 1408 22 Marietta Street Building, Atlanta, Engineers.

KENTUCKY

LOUISVILLE — expansion — Office of Chief of Engineers, Washington, D. C., approved expenditure of $2,000,000 for addition and improvements to plant of Consolidated-Vultee Aircraft, Inc.; Capt. John J. Hennessie, resident representative of the Army Air Forces at Vultee; appropriation will be used for extension of concrete apron and hangar annexes, enlarging manufacturing facilities; this expenditure is a supplement to the $1,500,000 appropriation for the improvement of runways, taxi strips, night lighting and drainage and grading of Standiford Field, adjoining the factory; work on the apron has begun and plant addition will get under way within the next few weeks; ramp will be increased by approximately 65,000 feet; architecture of new hangars will be under direction of Corps of Engineers; probably of fire-resistant construction such as steel and concrete; Consolidated-Vultee plant will be known as Modification Center No. 9.

LOUISIANA

NEW ORLEANS — pile clusters — Boh Brothers Construction Co., 2400 Cypress St., low bidder for pile clusters at shipyard of Delta Ship Building Co.; O. O. Carpenter, plant facilities engineer.

MARYLAND

BALTIMORE—power plant & electric facilities—Bethlehem Steel Co., 1101 Key Highway, received bids June 15, for alterations & additions to electric facilities at power plant; following were estimators: Baltimore Contractors, 711 S. Central Ave.; Cummins Construction Corp., 803 Cathedral St.; Davis Construction Co., 9 W. Chase St.; Leimbach & Williams, Inc., 30 W. Biddle St.; all Baltimore; Irwin & Leighton, 1505 Race St., Philadelphia, Pa.

MISSOURI

JEFFERSON CITY — plant repairs — Missouri Permanent Seat of Government, 100 Capitol Bldg., c/o Ted Ferguson, State Purchasing Agent, 105 State Capitol Bldg., received bids June 22, for plant repairs.

ST. LOUIS—plant—Blanton Co., 3400 N. Wharf St., received bids June 28, for plumbing and plumbing fixtures, electric work and electric fixtures to Soy Bean Processing Plant, 3400 N. Wharf St.; Gray & Pauley, 3800 West Pine Blvd., Archt.; following bid on general work; Woermann Construction Co., 3800 West Pine Blvd.; Alport-Carlo Construction Co., Ambassador Bldg.; E. A. Brunson Construction Co., 4052 Forest Park Blvd.; Dickie Construction Co., 517 Louderman Bldg.; J. E. Williams Construction Co., 6635 Delmar Blvd.; University City; Kloster Co., 5215 S. Grand Blvd.

ST. LOUIS—repair work—Ted Ferguson, State Purchasing Agent, Room 105, State Capitol Bldg., Jefferson City, received bids June 29 for repair work for boilers, Nos. 3 & 4.

NORTH CAROLINA

GREENSBORO—plant—General Foundry and Machine Co., A. R. Miles, Manager, will convert plant for the manufacture of steel castings as soon as allotments can be secured; cost will be approximately $100,000.

JACKSONVILLE — lumber — Blythe Brothers, Goode Construction Corporation and Harrison-Wright, have leased the Jacksonville Lumber Co.'s plant, Charles E. Warn, plant manager; plant will manufacture lumber for the New River Base.

MURPHY—box plant—Cherokee Lumber Corp., plans erecting box factory; leased 5 acre site for factory and storage facilities.

RALEIGH—ore drilling—State Department of Conservation and Development, Robert Redwin, Industrial Engineer, announced that Senate subcommittee, approved allocation of $350,000 for drilling and exploring North Carolina's mineral deposits.

SHELBY—cannery—Residents of Bethware Community in cooperation with vocational agriculture department of school, have plans for erection of community cannery and all needed equipment has been allotted and approved; an abandoned classroom in basement of the high school building is to be remodeled to house cannery.

OKLAHOMA

Pipe line—Plans for construction of 200 mile natural gas pipeline between Guymon and Blackwell are still in preliminary stage; Cities Service Transportation & Chemical Co., with offices in Masonic Temple Bldg., Ponca City, Okla., are handling the construction; estimated cost $15,000,000.

TENNESSEE

KNOXVILLE—terminal — War Production Board has restored priorities for the proposed $500,000 terminal at Knoxville to be built by TVA.; similar terminals now under construction at Chattanooga and Guntersville and Decatur, Ala.; four terminals will handle cargoes hauled over the nearly complete 650-mile navigation channel, extending from Knoxville to the mouth of the Tennessee at Paducah, Ky.

MEMPHIS—building—E. L. Mercere Inc., 191 Madison Ave., purchased from the Massachusetts Mutual Life Insurance Co., Farnsworth Bldg., the building at 99-101-103 S. Second St., at cost of $43,000; building to be modernized before company moves; Hanker & Heyer, Archts., Commerce Title Bldg.

NASHVILLE—equipment—Winston Manufacturing Co., Jack Laribe, General Manager, Nashville, will begin shortly, the production on the $1,000,000 order for earth-moving equipment for Bureau of Yards & Docks.

NASHVILLE—expansion—SeLing Hosiery Mills, Inc., reported arranged financing with Defense Plant Corp., Washington, D. C., in amount of $20,000 for additional equipment.

TEXAS

HOUSTON—chemical plant—John Maher & Co., chemical compound manufacturing concern purchased a manufacturing plant at 1111-15 Silver St., from the City Investment Co., for $26,500.

Oil pipeline—War Production Board approved construction of new crude oil pipeline to have daily capacity of 54,000 barrels, from Sundown, Texas, to Drumright, Okla.; pipeline to extend 383 miles; to be built and operated by Stanolind Pipeline Co.; approximately 44,600 tons of steel required; estimated cost, $7,000,000.

VIRGINIA

LYNCHBURG—air routes—Division of Aeronautics of the State Corporation Commission, Lt.-Col. Allan C. Perkinson, Director, revealed that preliminary steps have been taken to organize the Central Airlines, Inc., to provide air service between Lynchburg and Charlottesville to Washington, Baltimore, Philadelphia and Newark to New York City; south from Lynchburg through Danville, Reidsville, Greensboro, Winston-Salem, High Point, Salisbury, Charlotte, Spartanburg and Greenville to Atlanta, etc.; application has been filed by Abe B. Cohen and Wilbert G. Burnette, Lynchburg; applicants propose to charter a corporation with capitalization of $1,000,000 with $250,000 in working capital upon incorporation.

WEST VIRGINIA

BLUEFIELD—mill—Esmond Mills, Inc., with plants at Esmond, R. I., and Waynesboro and Lynchburg, Va., plans establishing branch, blanket plant at Bluefield.

RANSON—plant—R. J. Funkhouser, acquired the Goetz saddlery factory and will manufacture plane parts and gun parts; H. H. Jennings, to be in charge.

WHEELING—building—Block Brothers Tobacco Co., J. A. Bloch, Pres., 4000 Water St., has preliminary plans for post-war improvements; replace present plant with modern building, 250x100 ft.; involve approximately $1,000,000.

Advertising the South

Early last fall the Southern Railway System entered upon a broad advertising campaign to tell the nation of the great progress the South is making. In a booklet reproducing some of these advertisements which have made the story of the South a compellingly interesting one, a foreword by President Norris says:

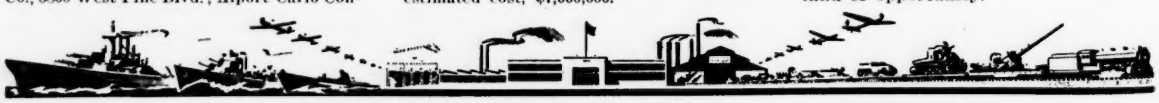
"The Southern Railway System has an abiding faith in the future of the territory it has been privileged to serve for more than half a century.

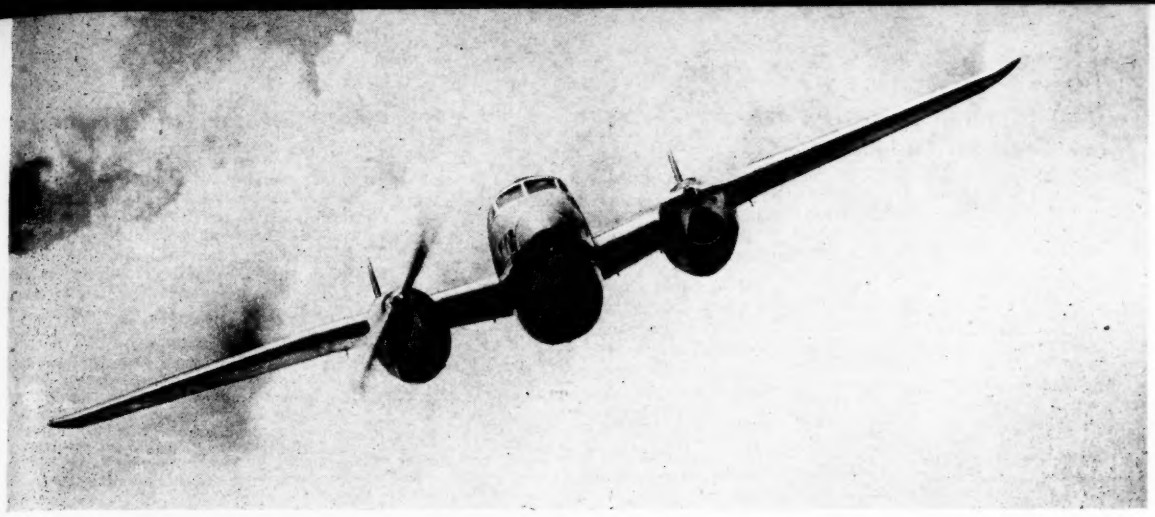
"In these advertisements, the Southern is continuously telling the inspiring story of the Southland's tremendous contribution to the war effort—its amazing industrial, commercial and agricultural growth—its progressiveness—its wealth of natural resources, intelligent workers and dependable, economical transportation—and its bright future in the new world which will begin with Victory."

It is estimated that an audience of 11,000,000 people has been reached every month, and it may be expected that the results will be far reaching in the effect upon the South's development. It could hardly be otherwise with such an informative, widespread publicity campaign which has been prepared by artists and experts who have handled the illustrations and text material.

The work of the Southern Railway may well serve as an example to others who are giving their thought and time to the fuller utilization of the South's resources. A fact which is generally recognized is that industries in more congested areas of the country find that the opportunity for expansion in the South is more advantageous than elsewhere.

The reader of these advertisements has been fortunate in having placed before him a vision of the days to come when private initiative and enterprise will be the main reliance of the country's future and that the South is the land of opportunity.





The Fairchild "Gunner" on its initial flight at Burlington, N. C., gave tangible evidence of the return of the aviation industry to North Carolina after an absence of 40 years when the Wright brothers brought fame to Kill Devil Hill and thus established what has come to be one of our largest industries. The "Gunner," which will be produced in quantities at the Burlington, N. C., plant of Fairchild Aircraft for the Army Air Forces, is a two-engined advanced trainer largely constructed of plastic bonded plywoods, has a power operated turret, retractable landing gear and flies in the 200-m.p.h. range.

$19,339,000,000 War Industrial Facilities Are 78 Percent from Government Funds

The value of war industrial facilities financed with public and private funds reached $19,339,000,000 by the end of March, the War Production Board reported recently. This includes all projects for which contracts have been let since June, 1940.

Of the total, $15,140,000,000 worth was financed by Government funds, while the balance of $4,199,000,000 was privately financed. These facilities include those whose estimated cost was more than $25,000 and were the direct obligations of the War and Navy Departments, Maritime Commission, Defense Plant Corporation, United Kingdom and loans of the Reconstruction Finance Corporation, or were privately financed as reflected by the issuance of necessity certificates. These figures indicate that to the end of March 78 per cent of the new industrial facilities financed since June 1940 were financed from Government funds, while 22 per cent were privately financed.

The largest item was for ordnance, including guns, ammunition and explosives, which called for the construction of factories estimated to cost nearly $5,000,000,000, or 26 per cent of all facility expansion. In this area, less than 5 per cent of the financing was with private funds.

The next largest grouping is for aircraft, aircraft engines, parts and accessories, for which $3,327,000,000 has been committed. In this area 7 per cent of the financing was from private funds. This group represents 17 per cent of the total cost of war facilities.

Ship construction and repair facilities amounting to $2,086,000,000 were built or are being constructed from Government funds. In this instance, 5 per cent of the funds came from private sources.

The highest proportion of private funds occurred in non-manufacturing facilities—power lines, mining, transportation, etc. The total in this area amounted to almost 9 per cent of the total funds for war industrial facilities, but 80 per cent of the $1,726;000,000 approved for the purpose was privately financed.

In the area of chemicals, petroleum and coal products, also, private financing exceeded public financing. Of the $1,969,000,000 allotted for facilities in this field, $665,000,000 or 34 per cent was privately financed.

The following table shows the total estimated cost by categories and the amount of public and private financing:

VALUE OF WAR INDUSTRIAL FACILITIES FINANCED WITH PUBLIC AND PRIVATE FUNDS
By Type of Product and Source of Funds Through March 31, 1943
(Thousands of Dollars)

Type of Product	Total Estimated Cost	Source of Funds: Public Estimated Cost	Source of Funds: Private Estimated Cost
TOTAL	$19,338,997	$15,139,822	$4,199,175
Aircraft, aircraft engines, parts and accessories	3,326,628	3,084,782	241,846
Ship construction and repairs	2,086,467	1,991,487	94,980
Combat and other motorized vehicles	502,550	424,950	77,600
Guns, ammunition, shells, bombs	2,096,847	1,869,707	227,140
Explosives, ammunition loading and assembling (excluding small arms)	2,868,109	2,856,357	11,752
Iron and steel products	1,816,392	1,261,238	555,154
Non-ferrous metals and their products	1,428,380	1,126,270	302,110
Machine tools and other metal working equipment	293,552	153,183	140,369
Machinery, electrical equipment and appliances	770,721	462,142	308,579
Chemicals, petroleum and coal products	1,968,734	1,303,751	664,983
Miscellaneous manufacturing	454,593	264,363	190,230
Non-manufacturing (power lines, mining, transportation, etc.)	1,726,024	341,592	1,384,432

$2,000,000 Detinning Plant Underway at Birmingham

Work was begun this month on the $2,000,000 detinning plant that will be located in Birmingham on the site of the old Vanderbilt Furnace, it was announced, after final negotiations decided the vote in favor of the Birmingham district.

The new plant will go into operations in about four months reclaiming both tin and steel from salvaged tin cans. The final location in Birmingham was made when it was pointed out that transportation facilities and conditions in this area would be most advantageous in supplying the salvaged tin cans from other sections of the country.

The H. P. Ferguson Company of Cleveland, builders of the plant, have had engineers making the initial survey at the grounds in preparation for starting the foundation for the Birmingham detinning plant. A capacity of 20,000 tons annually is expected to be handled by the new salvage industry.

Iron Printing Plates Developed

Electrolytic iron may become a metal of major importance in the printing industry should governmental restrictions on the use of war-scarce copper and nickel become too severe, research metallurgists of Battelle Memorial Institute, Columbus, Ohio, have indicated in a report of their experiments with substitute materials for production of printers' electrotypes and stereotypes.

After experimenting with 125 different iron plating solutions, engineers of the industrial research organization have developed a solution which will produce deposits of electrolytic iron satisfactory for normal electrotyping operations and for the hard-surfacing of stereotypes. Copper and nickel can be reduced from fifty to seventy per cent by processes which are now well past the laboratory stage and can be eliminated entirely by a process that works successfully in the laboratory and which is now undergoing commercial production tests.

The research leading to the development of the successful formula was sponsored by Printing Plates Research, Inc., a non-profit corporation.

16-Inch Pipeline Approved From Texas to Oklahoma

Construction of a 383-mile, 16-inch pipeline from Sundown, Tex., to Drumright, Okla., having an initial capacity of 54,000 barrels of crude oil daily, was approved last month by W. P. B. upon the recommendation of the Petroleum Administrator for War.

Materials for the line, which will be built and operated by the Stanolind Pipeline Company, will be made available from PAW's controlled materials allotment. Construction is expected to begin early in October, 1943, and should be in operation sometime in March, 1944, providing that materials and workmen are available on schedule. Some 44,600 tons of steel and $7,000,000 will be required to build the new line.

The pipeline will serve to provide Middle Western refineries with additional supplies of West Texas crude oil, thus meeting oil requirements in the midcontinent area, where crude oil reserves are declining.

Oil for the new pipeline will be taken from the Persian Basin region of West Texas, one of the last substantial crude oil reserves with producing capacity in excess of present pipeline outlets yet developed in the Southwest. The line will start, actually, in the Slaughter Pool, near Sundown, Tex., in the southwest corner of Rockley County, and will terminate in the vicinity of Drumright, Okla.

Only one pumping station will be needed to operate the line at 54,000 barrels-a-day capacity but other stations to be installed as needed will boost the capacity of the line to more than 100,000 barrels daily.

Oil delivered to the Drumright end of the pipeline will be pumped into working tanks, from which it can then be transferred to any of a number of existing trunk systems supplying crude oil to various refining centers.

Tonnage of Air Used in Pig Iron Production is Nation's Third Largest Product

Tonnage of air driven through blast furnace systems for the manufacture of pig iron will amount to more than 240,000,000 tons in 1943 and will be the third largest product of American industry.

This is estimated by the Compressed Air Institute and is based on iron and steel production figures.

During the 12-month period, we will be producing steel at the rate of 80,000,000 tons. This requires 60,000,000 tons of pig iron at the present time with the existing shortage of scrap to feed with the pig iron into the open hearth steel furnaces.

The modern blast furnace produces between 1,000 to 1,440 or more tons of pig iron per day. The production of one ton of pig iron requires approximately two tons of iron ore, half a ton of limestone, a ton of coke, and four tons of air.

The blast furnace is a vertical chamber standing about 100 feet high and 20 feet across. Iron ore, coke and limestone are fed in from the top and air blown in from the bottom. As the air ascends, it combines with the coke to form carbon monoxide, which reduces the ore to iron at high temperature.

The turbo-blower or centrifugal compressor, directly connected to the source of motive power, is used for blowing air through the blast furnace.

For this application, between 30,000 and 110,000 cubic feet of free air are blown through the furnace every minute with maximum pressure up to 35 pounds. One hundred ten thousand cubic feet of air is equivalent to 32,000 cubic feet of compressed air at 35 pounds pressure and initial temperature.

At 70 degrees Farenheit, or normal temperature, a cubic foot of air weighs approximately a quarter of a pound. Multiplying ¼-pound by 32,000 you have the number of pounds of air going through a furnace of that capacity in a minute, or 4 tons.

Keep on multiplying by the number of minutes in a day and the number of days in the year, and you have a good deal of air tonnage for one blast furnace alone.

In the blowing of the furnace huge quantities of gas are taken from the top of the furnace, which are a by-product of pig iron production and are available for power generation. The total tonnage of this by-product gas compares closely with the tonnage of some of the nation's largest natural resources.

23,000 N. & W. Employees Meet Via Radio

Twenty-three thousand Norfolk and Western Railway employees "got together" via radio on 19 stations in six states recently for the second in a series of wartime railroad meetings, which are supplanting their annual system-wide Better Service conferences for the duration.

"On-the-job" interviews with typical N. & W. employees, who are helping to keep the wheels rolling; authentic "on-the-spot" sound effects of fast freights and speeding passenger trains, with bells ringing and whistles blowing, and railroad songs by the famed N. & W. Negro Male Chorus featured the 30-minute program.

The first interview originated on a section of the railroad's track between Portsmouth and Cincinnati, Ohio, when radio listeners were told how N. & W. track is kept at a high standard of excellence, and the importance of track maintenance in wartime. Switching to Chicago, listeners heard how traffic department representatives aid in expediting the movement of war traffic.

The importance of locomotives and the increased speed of servicing them was described by employees working at the N. & W.'s Shaffers Crossing engine terminal, Roanoke. By recent expansion and improvements, the servicing capacity of this one terminal has been increased from 80 to 135 engines a day. The next interview was with the manager of mail, passenger and express traffic, also at Roanoke, who pictured the control center which directs the movement of troop trains, and the special movement of smaller groups of the armed forces.

N. & W. President W. J. Jenks concluded the broadcast with a review of the remarkable wartime record established by American railroads. Mr. Jenks pointed out that freight traffic on the N. & W.—measured in ton-miles per mile of road—is now greater than for any comparable railroad in the United States.

Subcontractors Wanted

For information, blue prints, specifications, etc., on the following items write or telephone the Philadelphia or Baltimore office of the War Production Board, quoting the symbol number of the item in question. You will then be put in touch with the engineer assigned to that item. Please quote the Manufacturers Record.

Ref. Spatig-23-3

A Penna. concern requires immediate facilities to machine 10,000 LOCK NUTS. Equipment required: Hand Screw Machine, ⅝" Hex. Stock. Overall length, 3/16 inch-7/16 inch—24 NS threads. Material: 410 Stainless Steel, heat treated. Will be furnished by the prime contractor. Prints can be seen at the Philadelphia Office.

Ref. Spatig-23-4

A Penna. concern requires immediate facilities to machine 10,000 LOCK NUTS. Equipment required: Automatic Screw machine, ⅝ inch Hex Stock. Overall length, 3/16 inch — 7/16 inch — 24 NS threads. Material: Naval bronze or equivalent. Will be furnished by the prime contractor.

Ref. Flanagan-23-1

A Penna. concern requires forging facilities for 2000 LOCOMOTIVE CONNECTING RODS. Equipment required: 12,000 to 16,000 pound Drop Forge Hammers. Deliveries: 200 to 300 pieces per month starting November, 1943. Overall dimensions: 44 inches long. Large end 13⅝ inches wide x 5½ inches thick, tapering to small end—7¾ inches wide x 5½ inches thick. Weight: 195 lbs., each. Material: 4140 Steel, allocated C.M.P., Priority AA1. Dies not furnished. Prints can be seen at Phila. Office.

Ref. Flanagan-23-2

A Penna. concern requires DIES FOR DROP FORGINGS LOCOMOTIVE CONNECTING RODS. Material: 4140 Steel. Dimensions: 43" long, 13" wide, 5" thick. Weight: 195 lbs. Priority AA1.

Ref. Spatig-23-1

A Penna. concern requires immediate facilities to machine 25,000 PIPE PLUGS. Equipment required: Hand Screw Machine, 7/16 inch Hex stock. Overall length—21/32 inch — ⅛ inch, Pipe thread. Material: 410 stainless steel, heat treated, and will be furnished by the prime contractor. Prints can be seen at the Phila. Office.

Ref. Spatig-23-2

A Penna. concern requires immediate facilities to machine 5000 PIPE PLUGS. Equipment required: Single Spindle Automatic Screw Machine, 7/16 inch Hex stock. Overall length—21/32 inch—⅛ inch Pipe Thread. Material: Naval bronze or equivalent will be furnished by the prime contractor. Prints at Phila. Office.

Ref. Dunning-Hulme-23-1

A Penna. contractor requires facilities for manufacturing STEEL SNAP HOOKS with approved lusterless rust-proof finish. One type is 4" long, ¾" eye, bolt type catch. The other type is 2¾" long with ⅜" eye, flat spring catch. The amounts required are: 125,000 of the bolt type and 1,000,000 of spring type, with a possibility of a further contract for 5,000,000 of bolt type and 400,000 of the spring type. All sizes are approximate. Production to start July 15th at a weekly rate of 25,000 for the spring type and 275,000 for the bolt type. Samples may be seen at the Scranton District Office or the Philadelphia Regional Office.

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Distributors of Sand-Gravel-Stone and Commercial Slag

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Our complete organization with years of experience in successfully executing large construction contracts of various kinds is prepared to undertake the construction of earth, masonry and concrete dams, drydocks, dredging of all kinds, river and harbor improvements, deepening channels, hydraulic filling and rock work, tunnels, railroad construction, sewers and waterways.

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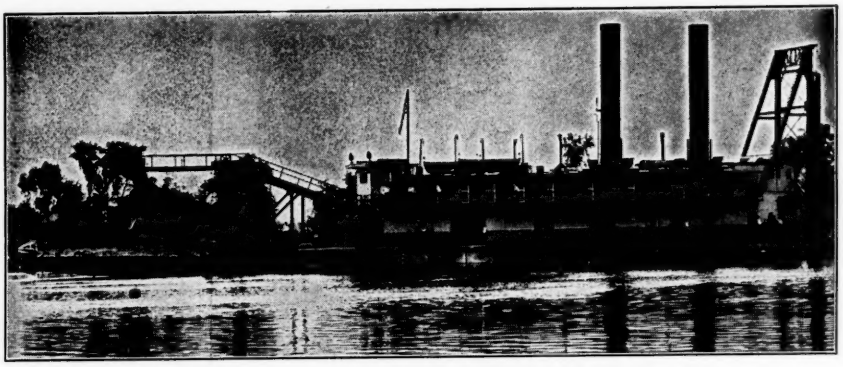
RIVER AND HARBOR IMPROVEMENTS—DEEP WATERWAYS AND SHIP CHANNELS



We are especially equipped to execute all kinds of dredging,
reclamation and port works in Southern waters.
Correspondence invited from corporate and private interests everywhere.

Contractors to the Federal Government

ATLANTIC GULF AND PACIFIC CO.

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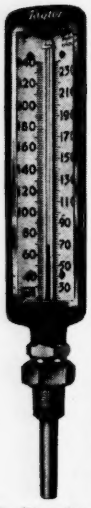
New Methods and Equipment

A New Industrial Thermometer Design

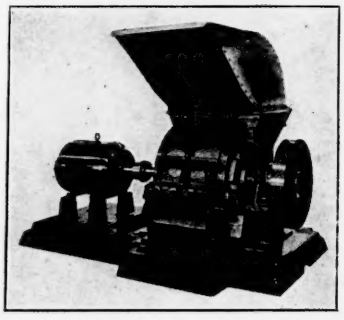
Taylor Instrument Companies, Rochester, N. Y., have announced a one-piece industrial thermometer. The one-piece case is shallower which makes it possible to see the mercury column through a wider angle of vision. The chromium-plated bezel fits snugly into the grooved case in such a way as to hold the thick glass front securely against four wavy tension springs. These springs are fastened securely under the scale by shakeproof screws. This construction results in a dustproof, rattleproof, and practically fumeproof thermometer.



The company has announced further that the new instruments will be equipped with easy-reading Binoc tubing. They will be furnished in combinations of straight and angle stems, with threaded or union connections, and in standard temperature ranges, within the limits of —40° F. to +750° F. Standard scale lengths are 7″ and 9″.

A New Turnings Crusher

The American Pulverizer Co., 1149 Macklind Ave., St. Louis, Mo., has announced the American Ring Turnings Crusher which was designed specially for reducing long curly turnings of low or high carbon steel, alloy steel or brass as produced by automatic screw machines, lathes and planers. Of rugged construction, the housing is heavy cast steel;



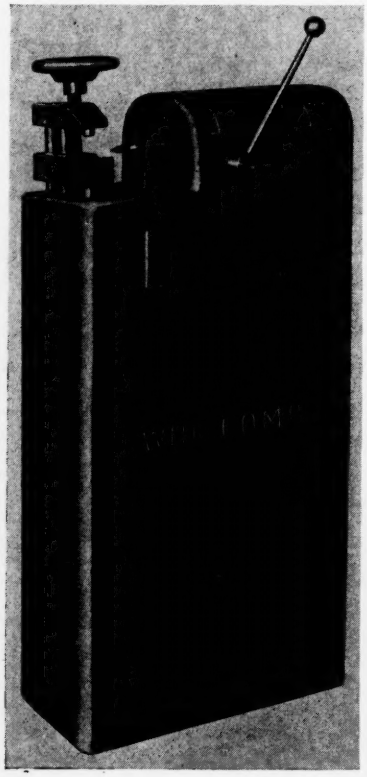
shredder rings, breaker plate and grate bars are manganese steel castings, and the shaft is alloy steel. The automatic apron discharges foreign material and prevents choking from overfeeding. Available in three sizes—#2400, #3800 and #4200—with a tons-per-hour capacity of 2½ to 3½, 5 to 7 and 6 to 8 respectively, the crusher and motor may be direct connected by a flexible coupling and mounted on a heavy common bedplate.

A New Motor Starter

The Type H. motor starter, a new addition to their industrial control line built to withstand severest war time operating conditions, was announced recently by Allis-Chalmers Manufacturing Co., Milwaukee, Wisc. High interrupting capacity disconnecting-type fuses are utilized in combination with a heavy duty oil switch in the new starter which has been developed for both induction and synchronous-type motors rated up to 1000 hp. at 2300 volts and 1750 hp. at 4600 volts, 3-phase, 60 or 50 cycles. Their usages cover: full or reduced voltage starting, dynamic braking, reversing and special applications. Short circuit protection up to 160,000 kva at 2300 volts and 320,000 kva at 4600 volts eliminates the need for a back-up breaker within these kva ratings.

Centering Round Bars is Simplified

The Whitcomb Manufacturing Co., 476 Eighth Street, Troy, N. Y., has announced a new tool for centering round bars preliminary to machining on centers—The Whitcomb Quickcenter. The machine is operated by placing the work on the vee-block and turning a handwheel until the work is held securely between a rising vee-block and a lowering button. When tight, the work is in line with the center

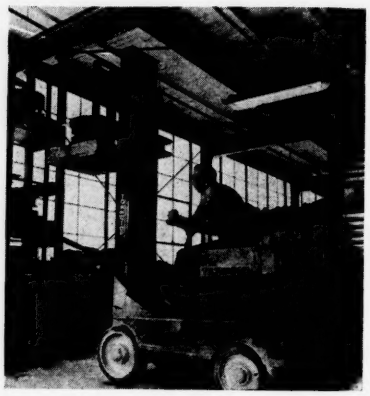


line of the spindle and the hand lever advances the center drill to the work. The operator moves only the handwheel and the lever. This makes possible an operation in seconds that can take over half an hour on a lathe.

The Quickcenter is equipped with a ¼ hp. motor and has speeds of 700, 1300 and 2300 r.p.m. adjusted by a three-step vee-belt sheave. The machine will center round bars from ½″ to 3″ in diameter within .005″.

Lift Truck Used to Store Dies

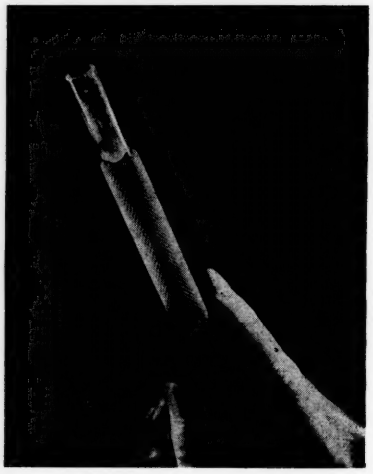
To keep heavy dies safely stored and readily accessible, Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio, makes ingenious use of lift truck equipment. Heavy wood racks form a "filing compartment" where dies, each on an individual special wood pallet with metal surface, may be quickly stored or with-



drawn without disturbing other units. In a few minutes one man operating a Towmotor can remove the proper die and deliver it where needed; since no equipment or personnel is required, other than that regularly engaged in moving materials, there is a minimum of disruption and the entire operation becomes a part of a coordinated materials handling system.

New Plastic Wrench

A new-type wrench made of lightweight Plexiglas and designed for assembly operations on radio equipment used by the U. S. Navy Bureau of Ships has been developed by Wells-Gardner Co., Chicago, and the Klise Manufacturing



Co., Grand Rapids, Mich. The new wrenches are used for tightening hexagonal nuts in aligning intermediate frequency coils in Naval radio sets. They are resistant to weathering and aging and may be machined, drilled, and threaded like any soft metal.

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Piling, Poles, Lumber, Cross Arms, Cross Ties

Also Wolmanized Lumber

Decay and Termite Proof—Can Be Painted

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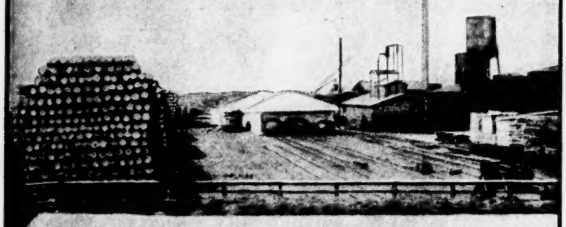

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New Orleans, La.

Atlantic Creosoting Co., Inc.
Norfolk, Savannah, New York

Plants at: New Orleans; Winnfield, La.; Louisville, Miss.; Savannah, Ga.; Jackson, Tenn., and Norfolk, Va.

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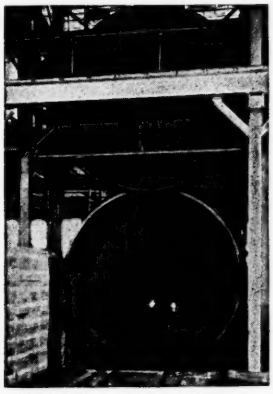

15'3" O.D. x 40' Long Vulcanizer

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General Steel Plate Construction designed for your requirements.

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—WELDED OR RIVETED—

We now manufacture and offer to the trade tanks in all sizes for pressure or gravity work. Also other steel equipment of either

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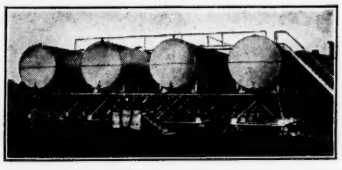
This applies to field as well as shop built equipment.

Write us for information and quotations.



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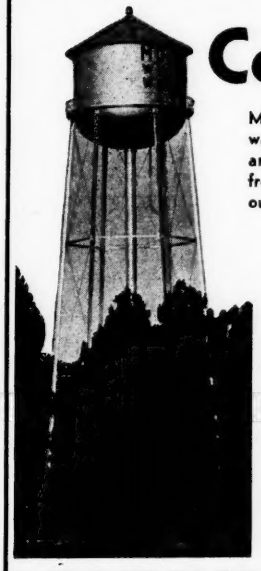
CHATTANOOGA, TENN.

Tank Builders For Over 80 Years!

Cities Served by Cole Tanks



Many municipal or privately owned water works have had us build tanks and elevated towers to specification from their own engineer's design or ours. Some of the cities served are:

CHARLOTTE, N. C. (Million gallon tank)
CLEARWATER ISLAND, FLA.
DANVILLE, KY.
MOBILE, ALA.
McPHERSON, KAN.
ST. PETERSBURG, FLA.
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NEWNAN, GA.

In addition to water tanks we also build tanks for acid, dye, oil, creosote, chemicals, etc., as well as other fabricated products of Quality steel and alloy steel plate. Let us figure on your requirements.

An erection for Mobile Water Works

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R. D. COLE MANUFACTURING CO.
ESTABLISHED 1854
NEWNAN GEORGIA

DAVIS CYPRESS TANKS

TAKE CARE OF THEMSELVES -- WHY?

Well, they are built of well known cypress and 50 years' practical experience. Installations all over the South. We make good wood pipe also. Ask for catalogue.

DAVIS CYPRESS TANKS

G. M. DAVIS & SON
P. O. Box 5, Palatka, Florida

Industrial News

McKenna Metals Appoints Three New Southern Representatives

Added to their list of new representatives of their national sales and service organization, McKenna Metals Co., Latrobe, Pa., appoints the following in the South: P. D. Browne, 1124 Allen Bldg., Dallas, Texas; Engineering Sales Co., 308 Corandelet Bldg., New Orleans, La.; Engineering Sales Co., 14 East 18th Street, Tulsa, Okla.

Irving Subway Grating Co., to Study Post-War Products

A market builders' committee to study and develop suggestions for post-war products has been formed at the Irving Subway Grating Co., Long Island City. One of the major functions of the committee will be to cooperate with sales representatives in the field in working out practical suggestions and ideas "that will open up new fields or result in new and marketable products that can be manufactured with our present equipment."

To stimulate the flow of post-war ideas to the committee, the company is offering a substantial incentive bonus to the district sales representative who contributes the best practical idea or suggestion before the close of 1943.

New Dow Division Announced

Organization of a service and development division for development of new chemical products has been announced by The Dow Chemical Company with headquarters at Midland, Mich. One of the new division's purposes is the study and further application of standard and new Dow products to industry in the post-war world.

D. K. Ballman, who will head this new division, said "the new division, which will take the initiative in contacting the technical men in other industries will seek to develop a technical consulting service. We will call the technicians' attention to present and possible uses of old and new Dow products which may solve their wartime problems. If we find that we have no answer to a feasible proposition, we will at once put our research laboratories to work on it."

H. K. Porter Co. Acquires Quimby Pump Co.

Purchase of Quimby Pump Co., with plants at Newark and New Brunswick, N. J., by H. K. Porter Co., Inc., Pittsburgh, Pa., has been announced by T. M. Evans, president of the Pittsburgh firm.

Established before the turn of the century, Quimby Pump Co., manufactures a full line of pumps, including screw, centrifugal and retex types used in industry. At present the company is also building considerable quantities of pumps for both the Navy and Maritime Commission. The Quimby plants will be operated as a division of H. K. Porter Co., Inc., manufacturer of industrial locomotives and chemical processing equipment.

Mengel Co. and U. S. Plywood Corp. to Market Goods Jointly

The Mengel Company, Louisville, Ky., and the United States Plywood Corp., N. Y., manufacturers of plywood and plywood specialties, have signed an agreement for the joint marketing of their products, including new products developed in their respective research laboratories. More than twenty-five manufacturing plants are operated by the two companies.

According to the announcement, a new organization, jointly owned and operated by the two companies, will be formed to establish new distributing units which, added to the distributing units presently owned by United States Plywood Corporation, will provide complete, nationwide service, effect substantial economies, and insure the reemployment of a large number of employees now with the armed forces.

U. S. Rubber Appoints New Belting Sales Manager

George C. Crabtree has been appointed manager of belting sales of United States Rubber Company, it was announced recently by Walter Gussenhoven, sales manager of the mechanical goods division. A native of New York, Mr. Crabtree was graduated from Cornell University in 1916 with a degree in mechanical engineering and has been with the rubber company since 1922. He is particularly well known in the mining industry because of his work in the field in connection with large belt conveyors.

National Tube Co., Completes "Big Inch" Pipe Order

Production of pipe for the world's largest oil line has been completed in record time at the Lorain, Ohio, pipe mills of the National Tube Company, and the last train load of the "Big Inch" has gone to its destination along the route of the 1,272-mile petroleum line extending from Texas to the East Coast.

Manufacturing the steel pipe for the 24-inch line for War Emergency Pipelines, Inc., this U. S. Steel Corp., subsidiary plant, since last July, produced 280,106 tons of seamless steel pipe for the line through which 300,000 barrels of oil will flow daily to points near the Eastern Seaboard. Production at many times reached a record of six miles a day, or enough to load a train of 45 cars.

Trade Literature

To obtain any of the following Trade Literature items, just address a postal card to the MANUFACTURERS RECORD, *Baltimore* (3), *Md., requesting the item by number.*

INDUSTRIAL MUSIC AND PRODUCTION—
Booklet—"Music and Manpower" Executives concerned with this problem will find it helpful in increasing war production in the face of dwindling manpower supply.
Write for T. L. 110.

PLANETARY MILLING FULLY EXPLAINED—
Catalogs—Available to production executives. (1) 14 pages on No. 3 Plan-O-Mill for cylindrical parts up to 8" work diameter; (2) 18 pages on the No. 5 Plan-O-Mill for larger parts. Each catalog in two colors, standard 8½" x 11" size.
Write for T. L. 100.

VENTILATION AND INDUSTRIAL FILTERS—
Catalog—No. 209 describes and illustrates standard line of air and liquid filters. The Company also builds filters for special appliances.
Write for T. L. 111.

(*Continued on page* 52)

EPPINGER AND RUSSELL CO.
Wood Preservers Since 1878
All kinds of Structural Timbers and Lumber Pressure Treated with Creosote Oil or
DU PONT CZC
80 EIGHTH AVE., NEW YORK, N. Y.
POLES • CROSS ARMS • PILING • TIES
POSTS, BRIDGE AND DOCK TIMBERS
Treating Plants—JACKSONVILLE, FLA. • LONG ISLAND CITY, N. Y.

BELMONT IRON WORKS
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STRUCTURAL STEEL
BUILDINGS AND BRIDGES
RIVETED-ARC WELDED
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CHANNEL FLOOR
Write for Catalogue
Main Office—Philadelphia, Pa.
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CRUSHED STONE
Only highest grades of crushed
LIMESTONE AND GRANITE
Meeting all specifications
CAPACITY—8000 tons daily
Blue Ridge, Va. Pembroke, Va. Pounding Mill, Va.
Boxley, Greensville County, Va.
W. W. BOXLEY & COMPANY
Boxley Building, ROANOKE, VA.

GLAMORGAN
PIPE & FOUNDRY CO.
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STRUCTURAL STEEL for BUILDINGS and BRIDGES
Capacity 1000 Tons per Month. 3000 Tons in Stock
Carolina Steel and Iron Company
The Largest Steel Fabricators in the Carolinas
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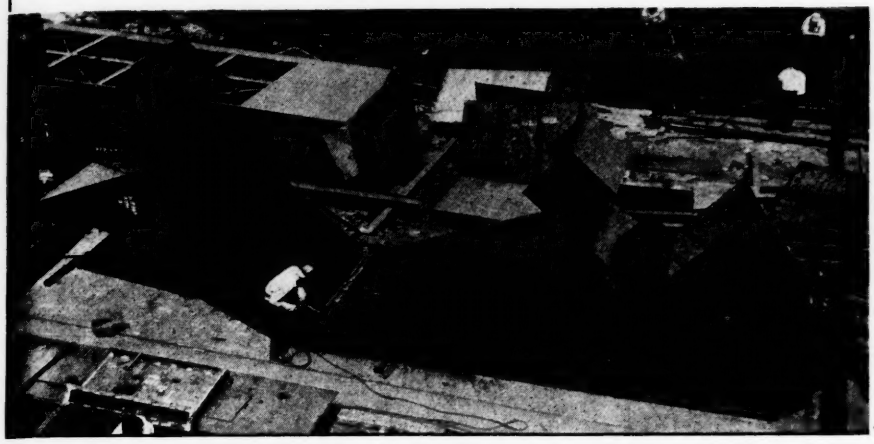
S. C. Rep. Edward McCrady, 307 Allen Bldg., Greenville, S. C.

Electric Arc Welded Structural Steel Plate Work

BETTER CONSTRUCTION AT LOWER COST



THE AETNA STEEL CONSTRUCTION COMPANY

Jacksonville, Florida

CONVERSE BRIDGE & STEEL CO.

Chattanooga, Tennessee

Structural Steel for all Industrial Structures, Buildings and Bridges

LARGE STOCK FOR IMMEDIATE SHIPMENT

Bristol Steel & Iron Works, Inc.

STRUCTURAL STEEL

For Buildings, Bridges and All Industrial Purposes

BRISTOL, VIRGINIA-TENNESSEE

District Sales Offices:

431 Third Nat'l Bank Bldg., NASHVILLE, TENN.

501 Public Service Bldg., ASHEVILLE, N. C.

As the conference ended . . .

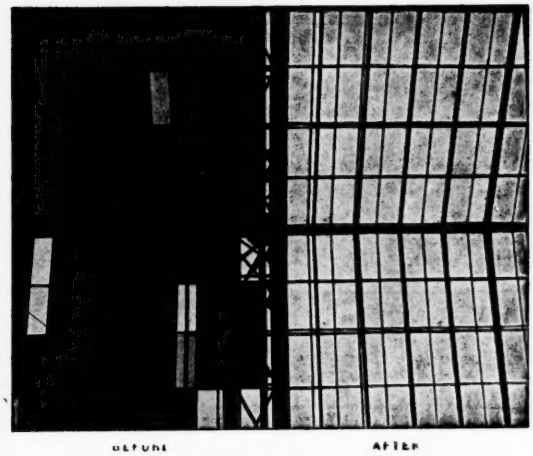
"I think Jim made a good suggestion in there . . . try Lyon, Conklin first for those metal screws, damper quadrants, cap and socket screws and sheet metals we need to fill this contract. If *anyone* has what we need, Lyon, Conklin's a good bet. I remember my great-grandfather used to get his building materials there . . . told us when we took over the plant that we could always depend on Lyon, Conklin. *Give them a call — Baltimore, SOuth 2000.*

Lyon, Conklin & Co. Inc.

Established 1860

Baltimore Maryland

Founded 1860



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FIRST SQUADRON ARMORY, PHILADELPHIA, PENNA.
8,000 SQ. FT. WHITE CORRUGATED WIRE GLASS SKYLIGHT

SPECIFY ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS

PENNSYLVANIA WIRE GLASS CO.

1612 MARKET STREET

PHILADELPHIA, PENNSYLVANIA

Trade Literature

(Continued from page 50)

DEGREASERS and CLEANERS—
Bulletin—Form No. 11543-1 SUP, describes the uses of four types of cyclodiene base hydrocarbon solvent degreasers and cleaners for metals. Special sections deal with painting or lacquering on wet surfaces immediately after work comes out of bath, and the protective rust inhibitive film left on surfaces of work after degreasing in cyclodiene.
Write for T. L. 103.

COKE OVEN PLANTS—
Booklet—"Coke Oven Plant Construction and Development in 1942," illustrated with photos and line drawings shows improvements in design, cites certain new processes and gives construction figures for 1942.
Write for T. L. 104.

WOMEN WORKERS—
Booklet—No. 1950, "A Message from the Women Soldiers of the Production Front," illustrated, contains speeches of four women workers selected by co-workers in the welding, machine shop, small-tools and assembly departments, as delegates to represent them at plant supervisory group meeting.
Write for T. L. 105.

CENTRIFUGAL BLOWERS—
Bulletin—#120-B-12, illustrates and describes with diagrams the installation, application and operating characteristics of centrifugal blowers and exhausters—both single-stage and multi-stage units. One section is devoted to a discussion of various control devices which provide suitable regulation and action views of various manufacturing and testing operations.
Write for T. L. 107.

HARD-FACING MATERIAL—
Bulletin—#153 describes the advantages and physical characteristics of "No-Wear" for hard-facing. Methods of application and typical uses of this material also are detailed.
Write for T. L. 108.

MEASURING AND CONTROL INSTRUMENTS—
Bulletin—No. Z6200. Form of condensed catalog listing principle items of equipment.
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COMPLETE LIST STANDARD STEELS—
List—New complete combined list of American Iron and Steel Institute and the Society of Automotive Engineers, Inc. Write for TDC-119A.
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Bulletin—12 pages describing Ucilon Protective Coating: what it is, who specifies it, its properties, its applications, and how obtained.
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Manual—32 pages covering standard and special dies. Standard line improved and expanded. Detailed recommendations on die shapes and complete illustrations and listings of die room accessories; all in the interest of fuller service and economies.
Write for T. L. 116.

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Booklet—"Experience Builds Them." With a background of 25 years devoted to the manufacture of heavy duty trailers, being distributed. Illustrates and describes Rogers complete line of largest trailers.
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Folder—containing factual information on zinc coated steel, a substitute in performing the work of nickel, tin, aluminum, brass or copper.
Write for T. L. 102.

PRODUCTION MACHINE TOOLS—
Catalog—52 pages with illustrations and detailed information about production machine tools and woodworking production tools together with the best uses for many interesting and unusual accessories.
Write for T.L. 122.

PROTECTION OF SHIPMENTS IN TRANSIT—
Booklet—Issue No. 11 features the handling problem of torpedoes—strapped with Acme steel bands. Their slogan is "Strap Them Right—Help Win The Fight."
Write for T. L. 114.

FITTINGS FOR WELDED PIPING—
Booklet—"Pipe Templates for Welded Fittings" tells how to fabricate fittings for welded piping installations by means of flame-cutting and welding. Also shows how to draw up and use proper templates for flame-cutting pipe to assure accurate, close fitting connections.
Write for T.L. 123.

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Folder—describes and specifies the safe load weights for bronze die casting chain at different specified angles. This chain is specially suited for pickling tanks and is available for plants engaged in war work.
Write for T.L. 119.

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Booklet—"Perfected A-C Crane Control," illustrated, with diagrams describes a controller that sets a new standard for the operation of electric cranes on alternating current.
Write for T.L. 120.

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Catalog—No. 750, 176 pages, fully illustrated with photos, diagrams, specifications and dimensions, covers the complete line of electric vibrating equipment for solving material handling and processing operations in all industries.
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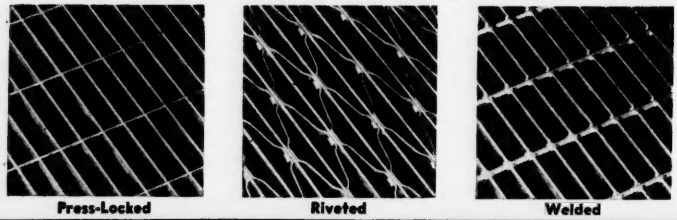

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Rates $3.00 *per day and up. Every room with bath or shower. Centrally located.*

The Southern Hotel BALTIMORE

Chemical Fertilizers in Wartime

(*Continued from page 39*)

used in the Soil Conservation Program. It is a long-time program, begun in 1933, and was not designed to be of help in the present emergency. At the present time, when we need every possible pound of food, feed, and fiber crops that it is possible to raise, any use of vital plantfoods that is not immediately effective in the production of such crops seems out of place. Much of it must be used on marginal lands. The fertilizer distributed by TVA is said to be for experimental and demonstration purposes, and is furnished free except for transportation and handling costs. It should not be necessary, in order to prove the value of a particular fertilizer, to distribute it year after year to 40,000 farmers as the TVA is doing, especially when the same or very similar materials have been supplied by the regular industry for many decades.

In an emergency, during a period when demand equals or may exceed the supply, materials should be used on good land to produce vitally needed crops. Long-range conservation should wait.

Much of the AAA distribution is in the form of normal superphosphate used on permanent pastures and haylands or for the purpose of growing legumes. None may be used on harvested tilled crops. To obtain its superphosphate, the AAA uses the well-known power of the Federal Government to buy cheaply on contract.

Synthetic nitrogen plants producing ammonia solutions for use in mixed fertilizers must ship as produced because storage facilities are lacking. These solutions must be mixed with superphosphate in order to absorb the liquid ammonia. Hence they can not be used by fertilizer manufacturers unless they have adequate supplies of superphosphate on hand.

The use of 1,500,000 tons of superphosphate unmixed in the Soil Conservation Program removes the absorbing agent for at least 30,000 tons of nitrogen in the form of ammonia solutions, and may result in the loss of this much nitrogen for the production of food

(*Continued on page 54*)

You Can't Afford Leaky Valves

- Repair parts are scarce
- New Valves require high priorities
- Your present Valves have to serve better-longer
- Regrinding helps make them last longer
- Note the Illustrations showing the six simple operations required

They're expensive and they may result in costly slow-downs and sometimes even shut-downs—which can't be tolerated in these critical times.

With proper care . . . periodic inspection to locate even slight leaks . . . and immediate repair, your valves will serve you better and last longer.

Lunkenheimer Valves are easy to keep in good operating condition. Seats and discs can be readily reground and all parts are quickly accessible without taking the valves out of the line. Properly cared for, they give you a practically permanent installation.

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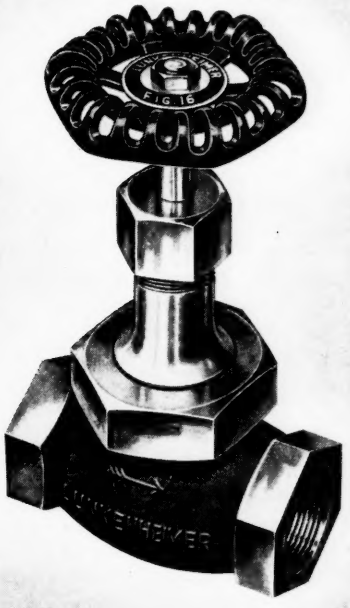
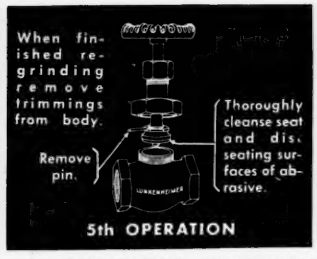


Replace trimmings in body and regrind.
Extension on bottom of hub should enter neck of body while regrinding.
Allow union ring to remain loose.
4th OPERATION


When finished regrinding remove trimmings from body.
Remove pin.
Thoroughly cleanse seat and disc seating surfaces of abrasive.
5th OPERATION

LUNKENHEIMER VALVES

3-79C-62

Fluorescent Lighting Maintenance

(*Continued from page* 33)

the next group of lamps. Such a plan will materially reduce the labor cost of lamp replacement since there will be less wasted effort and setup time required when all the lamps are changed at once. Also, the additional labor required for relamping the luminaires as they are cleaned will be almost negligible.

Maintenance Methods—In low bay areas, lighting equipment can usually be maintained from step ladders, but higher bays present more of a problem. In some plants, the fixtures can be cleaned and relamped from a traveling crane, but it is frequently undesirable to tie the crane up for this work. Movable telescoping platform lifts are quite satisfactory in areas where the presence of machinery does not interfere with their use. One of the most convenient means of access to the luminaires is from catwalks, but the installation cost is high and they are feasible only on special applications where all of the fixtures may be mounted on a few catwalks. Automatic disconnecting hangers which permit the luminaires to be lowered to the floor by a chain or rope offer another convenient means of facilitating maintenance. A monorail system provides another quick and easy method of servicing the lighter equipment from traveling platforms or cars and is frequently used for large fluorescent installations.

Results of Proper Maintenance

The importance of regular servicing of lighting equipment is strikingly illustrated by the results of tests conducted to determine the actual loss in illumination due to dirt collection on lamps and luminaires. In one case, a porcelain-enameled reflector for a fluorescent luminaire was removed from an average factory area and tested for light output in a photometric laboratory. Light output was checked during various stages of cleaning and results were as follows:

(1) Dirty reflector and dirty lamps—
22.8 per cent decrease in light output

(2) Dirty reflector and clean lamps—
18.1 per cent decrease in light output

(3) Reflector wiped with dry cloth—
6.2 per cent decrease in light output

(4) Reflector and lamps washed—
0 per cent decrease in light output.

This reflector had not been serviced for approximately 6 months; if the period had been longer, the amount of light being wasted would have been even larger. Another laboratory test on two high bay reflectors yielded the following results:

A. Open High Bay Reflector from average factory area

(1) As found—42 per cent decrease in light output

(2) Dry wiped—35 per cent decrease in light output

(3) Washed clean—0 per cent decrease in light output.

B. Enclosed Dust Tight High Bay Reflector from foundry

(1) As found—7 per cent decrease in light output

(2) Dry wiped—5 per cent decrease in light output

(3) Washed clean—0 per cent decrease in light output.

The length of time since the last cleaning of both A and B above was over a year. The tests not only illustrate how much light may be wasted through neglect but also show two interesting points. First, it is evident that dry wiping is entirely unsatisfactory for cleaning. The degree of ineffectiveness of dry wiping depends upon the character and oiliness of the dirt and the nature of the reflecting surface, but in no case is it adequate. Secondly, the comparison between A and B proves the economy of dust tight covers in extremely dirty locations, for B was in a much dirtier atmosphere than was A. In any case, whether the dirt be prevented from reaching the reflecting surfaces or whether these surfaces are kept at optimum efficiency by frequent washing, it is obvious that *it pays to keep lighting equipment clean.*

Chemical Fertilizers in Wartime

(*Continued from page* 53)

and fiber crops.

In the present emergency superphosphate should be first utilized to conserve nitrogen up to the amount furnished in liquid forms. Any surplus superphosphate above that amount should be used for the production of needed crops. Let conservation and long-range programs wait until our immediate war necessities are met.

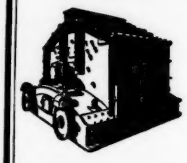
In closing it may be said that some justification might be found for extensive Governmental competition with private enterprise in this field if the industry were not performing its public functions; if it were either failing to deliver the quantity of its products needed or if it were delivering them at an excessive or unsocial cost. Such conditions do not exist. The table below compares the prices of a few important materials as between World War I and World War II.

Prices on these materials today are the same as they were in December, 1942, except for minor adjustments approved by the Office of Price Administration.

WAR-TIME EFFECT ON PRICES OF SOME FERTILIZER CHEMICALS AND MATERIALS

	Dec. 1913	*High in World War I and Date*	*July 1939*	*Dec. 1942*
Ammonium Sulphate $ per ton	59.00	157.00 (April 1918)	28.00	28.20–29.20
Sodium Nitrate $ per ton	44.00	110.00 (May 1918)	27.00	27.00–30.00
Ammoniating Solutions $ per unit N	(These synthetics were not available in World War I)		1.216	1.216
Phosphate Rock (Fla.) $ per ton	3.00	12.00 (July 1920)	1.90	2.00
Muriate of Potash (50%) $ per ton	40.00	365.00 (Jan. 1918)	26.75	26.75
Sulphur $ per ton	22.00	75.00 (Jan. 1918)	16.00	16.00

"PENNSYLVANIA" CRUSHERS



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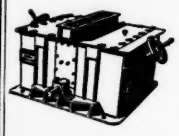

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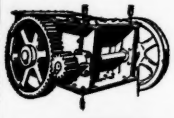

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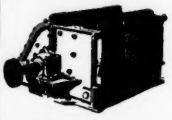

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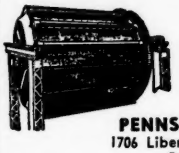

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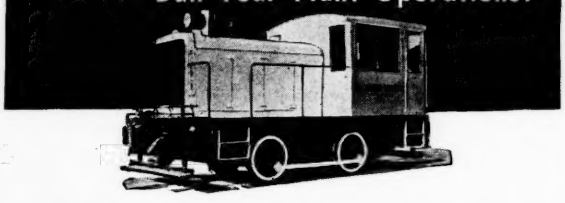

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M & H GATE VALVES are cast iron body, bronze mounted, with double-disc parallel seat or solid wedge top, non-rising stem or outside screw yoke. They come either with flanged or screwed connections. Valves for fire protection lines are marked "UA-FM" to denote approval of both the Underwriters and the Factory Mutuals.

M & H FIRE HYDRANTS are revolving head, dry top, bronze mounted. They also are approved by "UA-FM". Entire main valve assembly is removable through barrel without digging. Special Traffic Model is fitted with breakable bolts and stem coupling, designed to break at ground line under impact. Repairs are made simply by renewing bolts and coupling, without shutting off the water.

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CHECK VALVES	FLANGED FITTINGS
FLOOR STANDS	B & S FITTINGS
EXTENSION STEMS	CUTTING-IN TEES

M&H VALVE
AND FITTINGS COMPANY
ANNISTON, ALABAMA

Air Service Starts from Louisiana to Panama

(*Continued from page* 31)

with 200 cities in Central and South America and the West Indies.

The new route itself, from New Orleans to Balboa, bisects the Gulf of Mexico from North to South, with intermediate stops at Merida in Mexico, near the tip of the Yucatan Peninsula, at Guatemala City in Guatemala and Managua in Nicaragua. The schedules now call for three flights weekly.

Coursing the 2,000-mile route in 12 hours, the Clippers bring every city in the Mississippi Valley within 24 hours of the Canal Zone. The Twin Cities are now within 16 hours of Guatemala City and 24 hours of the Canal Zone, for example; Kansas City within 21 hours of the Canal Zone; Little Rock, 19 hours and Cleveland 23 hours. Moreover a passenger might board the Clipper at New Orleans, transfer to Pan American's affiliate, Pan American-Grace Airways, at Balboa and be in Lima, Peru, in 22 hours and 20 minutes or in Santiago, Chile, in 32 hours and 40 minutes.

What the new service means for both passengers and express in point of time is evident in a comparison with surface transportation to Guatemala City, say. Rail time between New Orleans and Guatemala City is six days. The fastest steamship schedule in peacetime, with a half-day overland haul by train from Puerto Barrios, was a minimum of four days. Air travel time, with the intermediate stop at Merida, is six hours.

The Clippers chosen by Pan American for this new service are the most advanced of all modern air passenger craft. Deluxe, four engined altitude-conditioned land transports, they are known in the aviation world as the Boeing 307. In their pressurized cabins they can normally accommodate a maximum of thirty-three passengers and carry, in addition, a ton of mail and express cargo. All-metal monoplanes, they are even larger than the Army's famous Flying Fortresses. On the New Orleans-Balboa flight they carry a crew of six—captain, first officer, co-pilot, flight engineer, radio officer and steward.

Strategically located along the Gulf near the mouth of the Mississippi, New Orleans has figured largely in the commercial development of a wide area as the principal seaport for trade and travel. In 1937 the shipping area served by New Orleans turned out manufactured goods valued at $27,151,672,000. In 1938 exports worth nearly $62,000,000 went through the port to Latin America while imports through it from Latin America amounted to approximately $68,000,000.

With the spread of the war to the Western Hemisphere air transportation through Pan American Airways' three other international air gateways to Latin America —Miami, Florida, Brownsville, Texas, and Los Angeles, California —was called upon to play a vital role in speeding goods and priority personnel between the Americas in the interest of the war effort. Meantime new and important developments are being made in Central and South America for the production of essential materials whose sources elsewhere have been cut off by the war. Central America in particular is taking on added importance as a source of such items as rubber, hard rice, tea, cinnamon, camphor, quinine, copra, vegetable oils, varnish gims, hemp fibres, chocolate, coffee, honey, citrus fruits, figs, and tropical hardwoods, gold, silver, copper, lead, iron, mercury, manganese and many other minerals.

In considering the New Orleans air route the Civil Aeronautics Board, the Federal agency charged with the economic and safety regulation of all United States civil aviation, put it this way:

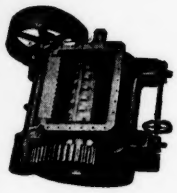
"The service under consideration relates to the most populous and to the most highly industrialized section of the United States and to Central American countries having considerable natural resources. It is reasonable to assume that the volume of trade between the areas will continue to increase, with a resultant flow of new travel and communication. Based upon this assumption as supported by the evidence, and the savings which the proposed route will afford traffic from the mid-west and eastern industrial areas of the United States in both mileage and time, we conclude that a service from New Orleans as a gateway to Central America is justified."

Business interests have been quick to see the advantages of the new service. "No house in New Orleans, no retailer, no wholesaler, no industrialist, no professional man, can fail to gain from the hemisphere significance of their community's new position," wrote Stuart A. Seelye, president of the New Orleans Association of Commerce.

The New Orleans Item editorialized: "One of the best indications of the meaning of the New Pan American air service to New Orleans, as a link with Central America, is to be found in one single phase of its time relations. Anybody in Merida or Guatemala can 'run up to New Orleans' to do a little shopping, make a business deal, or look at the sights, almost as quickly, and possibly a bit more comfortably than many of our country friends in Louisiana and Mississippi can do the same thing."

At the dinner in New Orleans on the eve of inauguration of the new service, President Trippe observed that even though the trade that normally courses through the port of New Orleans is $300,000,000 annually, the new air route would increase that figure still further after the war.

"Dynamic changes are taking place in midwestern industry," Mr. Trippe said. "Decentralization is creating new plants, many of which will be pouring new postwar products down the Ohio and the Missouri and down the Mississippi and out through this great port of New Orleans. Trade that builds lasting prosperity, however, is two-way trade. Latin America is opening new mines, developing new products and expanding her tropical plantations. This new reciprocal trade, too, from a prosperous Latin America, will benefit New Orleans and the people of the entire Mississippi Valley."



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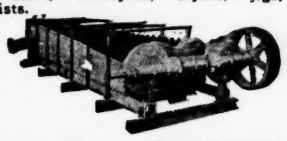

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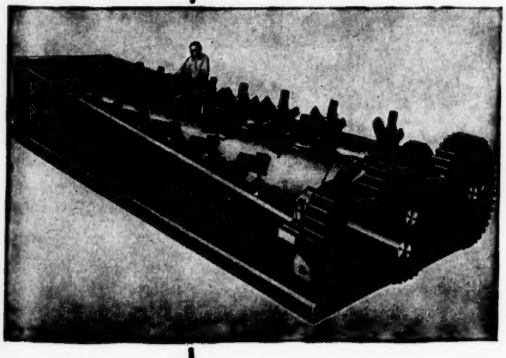

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300 PENN AVENUE, PITTSBURGH, PA.
REPRESENTATIVES IN PRINCIPAL CITIES

Cotton Serving the Nation

(*Continued from page* 29)

The blimps that patrol our coastlines in search of enemy submarines are huge cotton bags. Our barrage balloons are of the same material. The fabrics used for this purpose are made from the best cotton, and are tightly woven with exceptional precision.

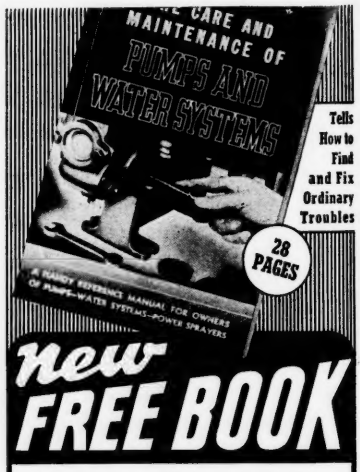
The control surfaces of metal planes, as well as most surfaces on gliders and training planes, are covered with special cotton cloth. This fabric is coated with lacquer to render it impermeable to air and water. Treated cotton fabrics and tapes are also used in many places within our planes. They are used to insulate the many miles of electrical wiring which are necessary to control all of the electrical devices in a modern airplane. Carburetor diaphragms, oil seals and gaskets contain cotton fabric which has been coated with special oil, gasoline, or heat resistant compounds.

Cotton is stepping into leather's shoes during these days of leather shortage. Cotton luggage and baggage is gaining in usefulness and popularity among soldiers and civilians alike as there is quite a range of construction available. For the members of the Armed Forces, there is the bag of heavy cotton duck, which is built over a non-sag frame. For civilians, there is the lightweight pyroxylin-coated canvas luggage which is a decided advantage with the growing scarcity of porters, and the rapid expansion of air travel. Coated cotton fabrics are not only being widely used in the manufacture of luggage, but they are also serving the important job of protecting all kinds of sensitive instruments from dirt and moisture. As an example, field radio sets are housed and transported in cotton cases.

The reference previously made to the jungle boots and muckluck shoes by no means tells the full story of the new developments of cotton footwear. The shortage of outsole leather has stimulated the experimental production of a large number of cotton outsole materials. In these experiments, various types of cotton fabrics, such as rug fabrics, beltings, drills, etc., have been impregnated with plastic substances to impart to them certain specific properties. Some of these impregnated fabric outsoles have been given a high abrasion resistance and will wear three times as long as leather. Indications are that another type is especially resistant to slippage and it may be that this type will be of particular value on board ship, as neither leather nor rubber is satisfactory on wet decks. Most of these materials are still in the experimental stage, although the tests which have been made by the shoe manufacturers prove that cotton outsoles can be handled by present shoe machinery. Although cotton outsoles, in their present state of development, would not be used for dress shoes if outsole leather was plentiful, there are certain types of shoes in which they could be advantageously used.

Laminated plastics have become an essential part of industry because of the multitude of machinery parts that are made from various laminates. For high impact

(*Continued on page* 60)



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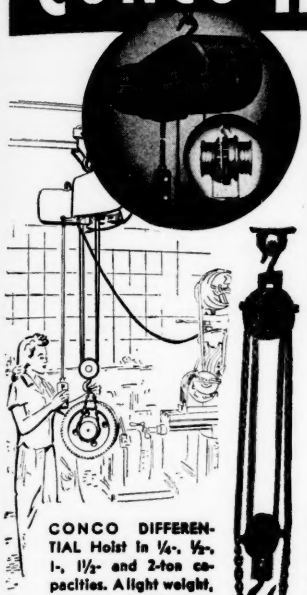
CONCO HOISTS



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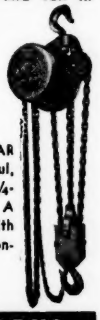
Several construction features adapt the Conco Torpedo Electric Hoist to women operators in your plant: Push button control, for easy, one-hand operation; Double drum construction for perfect load balance; Electric brake; Positive limit switch. Available in 250-, 500- and 1000-lb. capacities. Write us for our outstanding delivery and full information.

CONCO DIFFERENTIAL Hoist in ¼-, ½-, 1-, 1½- and 2-ton capacities. A light weight, low cost model that's profitable even for occasional use.



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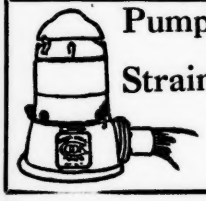

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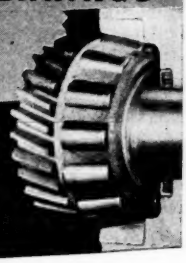
TIMKEN ROLLER BEARINGS in a SINGLE CYLINDER ENGINE?



Certainly—if it's a
WISCONSIN AIR-COOLED ENGINE

No Wisconsin Engine, so far as we know, has ever had a case of "Bearing Failure." Basically, this is an end result of using Timken Roller Bearings at both ends of the crankshaft. Normally, small engines are not provided with this safeguard . . . but every Wisconsin Engine, whether single cylinder or 4 Cyl.; 1 hp. or 35 hp., has this heavy-duty service protection. This is a typical example of Wisconsin Air-Cooled Heavy-Duty Engine design and construction . . . geared to maximum utilization of power-operated equipment.

MOST POWER Per POUND
WISCONSIN MOTOR Corporation
MILWAUKEE, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines

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SEND FOR CATALOGUE.
N. A. STRAND & CO.
CHICAGO
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Cotton Serving the Nation

(*Continued from page* 58)

and high compressive strengths, cotton fabrics are used as base materials. Examples of some of the mechanical applications which employ cotton fabric base laminates are motor slot wedges, electroplating, barrels, water and steam valve disks, friction disks, gears, water-lubricated bearings and other applications requiring toughness and resistance to wear.

The expanded program of ship construction has resulted in the increased use of cotton fabrics for welding screens, pipe coverings and waterproof covering for electric cables. Large quantities of cotton card sliver are used for caulking weather decks and treated cotton braids are used as gaskets for hatch covers. A new impregnated cotton tape is used to insulate dissimilar metals from one another, and thus prevent destructive electrolysis. It also inhibits corrosion and oxidation and is resistant to sea or fresh water, gasoline and oil.

Our imports of hard fibers declined so drastically that an acute situation developed in regard to rope for our new ships. To alleviate this condition, a cotton rope was developed possessing less extensibility, greater strength, and greater resistance to sea water than ordinary cotton rope.

Although most of the newer uses and unusual applications of cotton products are directly concerned with the war effort, cotton is doing its share on the home front as well. Found in use today on all the fighting fronts of the world, it is the stuff that victories are made of, and the stuff which scientific research will utilize in building a greater post-war world.

Sabine District's Enduring Industrial Development

(*Continued from page* 42)

Due to the concentration of refining within its boundaries, the Port Arthur-Beaumont section is "making the biggest single contribution to the aviation gasoline program" of any part of the country, Davies declared.

"As a matter of fact, you will shortly be turning out as much high octane gas as the entire country was producing a year or so ago," he commented. "The oil companies are doing a magnificent job. We knew that from the records before we came down here, and now we've seen it with our own eyes. The way men of the petroleum industry have gone at this assignment—accepting a terrific challenge—is most gratifying and they've done it in an amazingly short time."

It was pointed out that the demand for aviation fuel has far exceeded expectations due to the fact that not nearly as many U. S. and Allied planes have been shot down as was feared would be.

"Thus we constantly have more and more planes in the air—and the demand for fuel incessantly increases. This forces us continually to be raising quotas imposed on the refineries. And they have never failed to come through."

Transportation—not production or refining—is the chief bottleneck of the oil supply, Davies cited.

The war-laid pipe lines linking this area with upper sections of the country will continue in operation after peace comes, Davies asserted,

NATURAL GAS

A fuel whose value has been proven by years of use in a most diversified line of industrial applications.

Natural gas has created the possibility of effortless comfort by the facility, and economy with which it fits into the home.

SOUTHERN NATURAL GAS COMPANY

Watts Building **Birmingham, Ala.**

"because they will offer a cheap, easy, quick medium to get the oil where it's needed." He added, however, that the lines can carry refined products as well as crude oil and "will be a decided asset to Texas and this section of Texas." Whether or not the lines will ever supplant tankers "remains to be seen," he said.

"However, there will certainly have to be other means of transportation besides the pipe lines, because all those built and contemplated will supply only one-half of the crude petroleum needed to keep present eastern refineries in operation," the deputy petroleum administrator added.

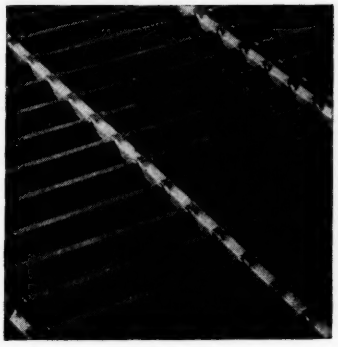
Although synthetic rubber serves admirably for passenger tires—with some authorities predicting it will be cheaper and wear longer—the nut of producing a topflight synthetic truck tire still remains to be cracked.

"But just give our enginers and chemists a little time, and they'll have an excellent truck tire, too," asserted Jeffers.

Others in the party were Lt. Col. L. S. McPhail, assistant to the undersecretary of war; Rear Admiral E. W. Mills, assistant chief of the bureau of ships; Capt. John E. Gingrich, naval aide to the undersecretary of Navy, Bradley Dewey, deputy rubber director; Capt. A. F. Kroeger, United States army, public relations; J. W. Livingston, vice president of the Rubber Reserve corporation, and Bruce K. Brown, assistant deputy petroleum administrator.

They were joined in Beaumont by Carl Reed of New York, president of the Lummus company.

Among other refining, construction and rubber officials who greeted the visitors were: Mike Halpern of New York, vice president of the Texas company; Bonner Barnes of Port Arthur, general manager of Texas refineries of Gulf Oil corporation; Charles Stevenson of Port Arthur, Gulf Oil Corporation; Arthur Kelly, general manager of all B. F. Goodrich chemical plants; J. B. Fritchmann of Port Arthur, personnel manager of the Goodrich latex plant; Fred P. Dodge of Port Arthur, works manager of the Texas Company refinery; William Hoffman of Port Arthur, president of Neches Butane Products company; Ed Heyden of Port Arthur, vice president and general manager of the Lummus company, general contractors for erections of the Port Neches butadiene plants; Thomas J. Sullivan of Pittsburgh, vice president of the Gulf Oil corporation; Robert Stewart of Port Arthur, manager of the Atlantic refinery; R. L. Verner of Beaumont of the Pure Oil Refinery; Frank L. Wallace of Port Arthur, assistant general manager of the Texaco refinery; Rhea J. Jackson, of the Magnolia refinery; W. W. Beach and P. L. Smith of the Magnolia, and Jack Allen, Pure Oil manager of Port Neches.



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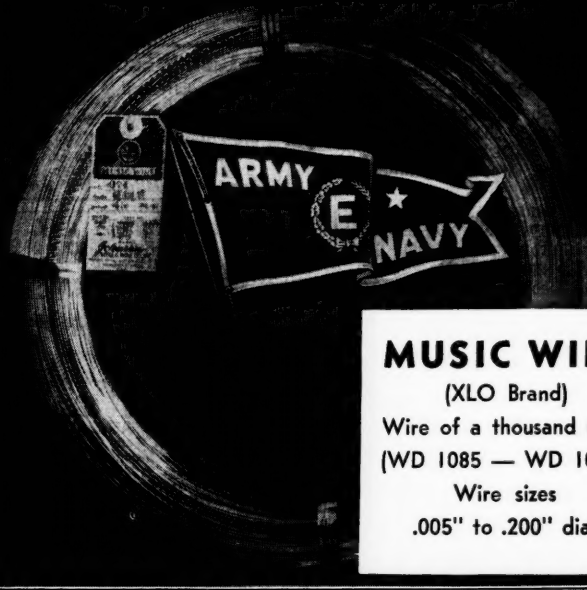

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Wire of a thousand uses.
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Wire sizes
.005" to .200" dia.

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STEEL TANKS
WANTED

1—7,000-barrel capacity, minimum ⅜" plate with metal top.
2—1700-barrel capacity, minimum ¼" plate with metal top.
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2 to 5—11,000 to 12,000-*gallon* horizontal tanks, preferably tank car tanks, minimum ⅜" plate, convex heads, size and shape about 8' x 34'.

The first mentioned three large sizes are approximately the capacity we want.

We are also interested in buying one steel-frame building, about 30'x50', about 12' high to eaves, complete with sash doors and asbestos sheeting and roofing.

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2—200 HP Atlas-Imperial
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240 H.P. DIESEL GENERATOR

240 H.P. Fairbanks Morse Style VA Full Diesel Engine & 200 KVA 3 ph. 60 cy, 2400 V.

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1—Pipe threading machine
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3—1500 kva Pittsburgh 22000 v. Primary 6900 v. sec.

INDUSTRIAL TRUCKS
1—Elwell Parker TOW TRACTOR—7' long, 42" wide, 42" high, 4—16" wheels—to coupling 13" from ground—Ball bearing 4 wheel steer—4 wheel drive—2000 lb. max. DBP complete with batteries.
1—Baker TOW Truck—8' long—64" high—48" wide —Ground to coupling 16, 18, 21, 23—4—19" wheels—coupling on frame 19" from ground.

SCALES
6—Fair. Morse #11½—3 beams, platform 16¼x21⅝, 0-450 lbs.

ENGINE GENERATOR SET
225 kw. Elec. Mchy. 2200 or 220 v. 3 ph. (can reconnect 3 ph.) 60 cy. dir. con. Ideal Steam Engine.

100 HP. LIDGERWOOD HOIST
Double drum Speedwell 2500 lb. pull at 450' per min. dir. driven by 100 HP. A.C. or D.C. Motor.

DIESEL ENGINE GENERATOR SET
217 KVA. G.E., 3/60/2300, 200 rpm., dir. con. to 260 HP Buckeye, horiz. 2 cylinder, semi-diesel 19" x 23", complete with switchboard, compressor, tanks.

A. C. MOTORS—3 ph. 60 cy.

QU.	HP	MAKE	TYPE	VOLTS	SPEED
1	100	West.	——	220	1750
1	100	G. E.	I-8	220	1200
1	100	Allis Chal.	——	440	900
1	100	G. E.	I-K-14	440	720
1	100	Allis Chal.	——	220	600
1	100	Cr. Wheeler	124QB	220	575
1	100	G. E.	I-K	440	400
1	125	Wagner	——	440	1800
1	125	G. E.	I	440	1800
1	125	Cr. Wheeler	124QB	220	720
2	125	G. E.	I-K	550	514
1	125	G. E.	I-K	440	450
1	125	G. E.	I-K	220	400
1	150	Allis Chal.	AR	2200	1800
1	150	Wagner	——	440	1800
1	150	G. E.	I-4	440	1800
1	150	Allis Chal.	AN	440	1800
2	150	G. E.	I-K	440	900
2	150	G. E.	I-K	440	600
1	150	G. E.	I-K	440	514
1	150	G. E.	I-K	220	450
1	150	Westingh.	LC	2200	327
1	200	G. E.	KT	2200	1800
1	200	G. E.	I-K	2200	1200
1	200	West.	CS-967A	2200	900
2	200	G. E.	I-K	550	720
1	200	West.	CS	220	580
2	200	G. E.	I-K	220	600
1	200	G. E.	I-K	220	514
1	225	G. E.	Syn.	2200	200
1	250	G. E.	I-K	550	720

25 CYCLE MOTORS—220/440 V.

QU.	HP	MAKE	TYPE	RPM
1	75	G.E.	I-4	900
1	75	G.E.	KT-357	900
1	75	Al. Ch.	AN	900
3	50	G.E.	KT-547	900
3	40	G.E.	KT-347	900
6	40	Al. Ch.	AN	900
1	35	Western Elec.	SL13B	300
1	35	Westg.	M	900
1	30	Westg.	C	720
1	30	G.E.	KT	900
7	30	Al. Ch.	AN	900
2	25	Westg.	MS	715
9	10	Al. Ch.	AN	900

Write for Stocksheet.

Duquesne Electric & Mfg. Co.
Pittsburgh, Pa.

FOR SALE

Synchronous Motors:
650 HP. General Electric type ATI 550 volt 3 phase 60 cycle 240 rpm with control and drive.
242 HP. Fort Wayne (General Electric) 2300 volt 2 phase 60 cycle 514 rpm rails and pulley.
200 HP. General Electric type ATI 220 volt 3 phase 60 cycle 720 rpm with control.

Squirrel Cage Motors:
500 HP. General Electric form K 440 volt 3 phase 60 cycle 1200 rpm with control
225 HP. General Electric form K 2200 volt 3 phase 60 cycle 600 rpm with control
150 HP. Westinghouse type CS 440 volt 3 phase 60 cycle 900 rpm with compensator
100 HP. Westinghouse type CS 550 volt 3 phase 60 cycle 600 rpm (two in stock)
75 HP. General Electric form K 2200 volt 3 phase 60 cycle 514 rpm

Adjustable Speed 220 volt D.C. Motors:
100 HP. Westinghouse type SK 450 to 1000 rpm
80 HP. Burke 200 to 800 rpm
35 HP. General Electric 625 to 1300 rpm

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CRANES: Locomotive: 15, 20, 25 & 35 ton
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DERRICKS: GUY: 5 ton, 7½ ton, 15 ton
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BELT: Conveyor: 14 In., 16 In., 18 In., 24 In., 30 In., 36 In., 40 In., 48 In., 60 In.
IDLERS:—36 In., 30 In., 24 In., 18 In., 16 In. and 14 In.
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Marion Model 32 Steam Shovel, 1½ yds.
Brownhoist ½ yd. Crane, gas, 30' bm.
Bucyrus Erie 50B Steam Shovel, 2 yds.
Northwest Model 105 Gas Crane
Industrial Loco. Crane, 20 tons, steam
Ohio Loco. Crane, 22½ tons, electric

GOOD ITEMS
2—Allis Chalmers L Tractors with 12 yd. Garwood Scrapers
2—Allis Chalmers L Tractors with 15 yd. Garwood Scrapers
Koehring 27E Paver, new 1939.
Butler Concrete Plant, 350 tons, new 1941
Blaw Knox 50 ton, 2 compt. Bin, weigh batcher
Hayward 2 yd. Clam. Rehandling Bucket
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Vulcan 6 ton Gas Locomotive, 36" ga.
3—30 ton standard gauge Flat Cars, rebuilt.
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B.S. 10 ton, 3 wheel steam Roller
Steel Stiff-leg Derrick 15 tons, 100' bm.
Steel Stiff-leg Derrick 10 tons, 70' bm.
1—#7 McKiernan & Terry Pile Hammers
2—#5 McKiernan & Terry Pile Hammers
3—#3 McKiernan & Terry Pile Hammers
Allis Chalmers 10" cent. elec. Pump, 3500 GPM.
4" Barnes gas Duplex Plunger Pump
2—C.H.&E. Model 28 Saw Tables, elec.
2—Butler 16 ft. Pug Mills
Rex Pumpcrete Outfits. Model 200, 190, 180, 160
I R. 310 cu. ft. Air Compressor, Portable
2—HRT 150 HP. Boilers.

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30 Church St. N. Y. City

U. S. Lumber Production

Lumber production in the United States for the first quarter of 1943 is estimated at 7,141,109,000 board feet, and is not far under the estimated first-quarter goal needed to meet total military and essential civilian requirements of 32 billion board feet for 1943.

Monthly production has risen steadily during the first-quarter period, with 2,199,240,000 board feet in January; 2,307,448,000 board feet in February (4.9 per cent increase over January); and 2,634,421,000 board feet in March (14.2 per cent increase over February).

March production, according to data compiled by the U. S. Department of Agriculture Forest Service in cooperation with WPB, comprises 2,096,063,000 board feet of softwoods and 538,358,000 board feet of hardwoods. Among the important softwoods, with production increases in March as compared with February are: Douglas fir, Noble fir, western hemlock, ponderosa pine, sugar pine, western white pine and redwood in the West; and hemlock and northern pine in the East. Important hardwoods with increased production in March as compared with February are: ash, basswood, beech, birch, hickory, hard maple, white oak, red oak, and yellow poplar. March production of southern pine was 5.4 per cent less than in February.

March production figures for Southern regions and percentage changes from February production are as follows:

Appalachian (West Virginia, western Virginia and North Carolina, eastern Kentucky and Tennessee, small northern parts of Georgia and South Carolina): 153,432,000 board feet; 6.8 per cent increase.

South Central (Missouri, western Kentucky, most of western Tennessee): 62,562,000 board feet.

South (Virginia, North and South Carolina, Georgia—except portions included in Appalachian region; southwestern Tennessee, Florida, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas): 1,015,372,000 board feet; 3.2 per cent decrease.

F. H. Shaw Wins Hyatt Award

The annual John Wesley Hyatt Award, for outstanding achievement in the plastics industry was conferred for the year 1942 on Frank H. Shaw, president of Shaw Insulator Company, Irvington, N. J.

Mr. Shaw received the award for having developed and perfected the transfer molding of thermosetting plastics, without which the production of many intricate and delicate plastic parts for war and industrial equipment would be impossible. Transfer molding, one of the industry's most important developments, is a method for molding thermosetting plastics, whereby the material is subjected to heat and pressure and then forced into a closed mold cavity.

N. & W. Employees Relief Fund

Benefits amounting to $148,920 were paid to members of the Norfolk and Western Employees' Relief Fund during the first quarter of 1943, according to the quarterly report of the railway's relief and Pension Department.

Receipts of the fund during the quarter, which ended on March 31, totaled $212,697, the report showed. At the end of the quarter the fund had a balance of $4,615,702.

Since establishment of the fund in July, 1917, members and their families have been paid in sickness, accident and death benefits a total of $14,519,712. For the establishment and operation of the department, the entire expense of which is borne by the railroad, the Norfolk and Western has spent $3,178,744.

Lend-Lease Program Nears $12,000,000,000

Lend-lease aid during May amounted to $790,000,000, bringing the total since the beginning of the lend-lease program to $11,893,000,000. Of this amount, $9,930,000,000 represents goods transferred and $1,963,000,000 services rendered. Of the amount for May, $716,000,000 was for goods transferred and $74,000,000 for services rendered.

Cumulative exports of lend-lease

FOR SALE:
6 Railroad flat cars.
1 Locomotive.
2 Pavers.
3 Compressors.
1 16 yd. Scraper.
1 Steam crane.
100 MBF Used planking
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■ Help Wanted

WANTED: Man with general office or field sales experience by large reputable manufacturer of seamless and electric welded tubing, alloy and carbon steels. Please apply, giving full information, experience, etc. to No. 9552 care Mfrs. Record.

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■ Agencies Wanted

Want line of steel products for states of Indiana and Kentucky. Have been 18 years in the steel business, both mill and sales departments. Have had 4 years of technical college training in metallurgy and am experienced in alloys and stainless steels. Am well known in this territory, and acquainted with all buyers of steel products. Equipped to give best of representation.
Address No. 9557 c/o Mfrs. Record

Sales representative in South Carolina wants several new accounts appealing to textile manufacturing and finishing industries for engineers and contractors. College education—12 years experience in mill supplies—specialties — paint — leather belting — etc.
No. 9558 c/o Mfrs. Record

goods to the end of April, the last month for which these figures are available, totaled $8,260,000,000. Exports for the month of April totaled $839,000,000, the highest mark ever reached in a single month.

The difference between the cumulative value of goods transferred under lend-lease and the value of lend-lease exports is due to three factors—the value of ships transferred to lend-lease countries and sailed to their destination under their own power; goods turned over to lend-lease countries and used in the United States; and goods transferred but not yet exported.

These three items are included in lend-lease transfers but not in lend-lease exports. In addition, cumulative figures on lend-lease transfers cover one month more than the figures on exports.

Exports of munitions to April 30, 1943, amounted to $4,278,000,000, or 52 per cent of total lend-lease exports; exports of industrial materials amounted to $2,177,000,000, or 26 per cent: and exports of food and other agricultural products amounted to $1,805,000,000, or 22 per cent. Food-stuffs constitute the most important single item of lend-lease exports, totaling $1,495,000,000, with aircraft second, totaling $1,387,000,000.

Munitions led all exports in April with $512,000,000, or 61 per cent of the total; industrial materials comprised $205,000,000, or 24 per cent; and food and other agricultural products $122,000,000, or 15 per cent. Exports of munitions and industrial items exceeded those of the preceding month by $127,000,000 and $29,000,000 respectively; food and other agricultural products declined by $29,000,000. Among the individual items of exports, aircraft led for the month, with $186,000,000, followed in order by tanks, foodstuffs, ammunition, metals, motor vehicles, machinery, general industrial items, ordnance and petroleum products.

In April, exports of lend-lease goods to United Kingdom totaled $363,000,000, those to Russia amounted to $233,000,000 and to Africa and the Middle East $111,000,000. The increasing importance of exports to the U.S.S.R. is indicated by the fact that her total is now $2,123,000,000, or 26 per cent of all lend-lease exports, despite the fact that she did not begin to receive aid until the latter part of 1941.

WELDING POSITIONER—
Bulletin—No. 196 illustrates and describes in detail a new 2500-lb. capacity hand-operated welding positioner.
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Bulletin—No. 188, with illustrations and diagrams, describes turning rolls for facilitating the welding of large cylindrical tanks and drums.
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MANUFACTURERS RECORD
BALTIMORE 3, MD.

To
MANUFACTURERS
WANTING
REPRESENTATION
in the South

ACCOUNTS WANTED

Sales representative in South Carolina wants several new accounts appealing to textile manufacturing and finishing industries for engineers and contractors. College education—12 years experience in mill supplies—specialties—paint—leather belting—etc. No. 9558 c/o MANUFACTURERS RECORD, Baltimore 3, Md.

Engineer and sales agent well known in St. Louis territory, reaching power plants, machine shops, etc. wants additional accounts. Address No. 9562, c/o MANUFACTURERS RECORD, Baltimore 3, Md.

Home furniture, floor coverings, builders hardware—to sell through wholesalers only. Have large following in the South. Have established residence in Florida. Write George W. Russell, c/o MANUFACTURERS RECORD, Baltimore 3, Md.

In excellent position to take up worthwhile representation. Have been handling electric meters, time switches and other electric equipment which the war has cut off. Write C. Robert Churchill, c/o MANUFACTURERS RECORD, Baltimore 3, Md.

Want to add new accounts to present line. Prepared to handle industrial accounts; factories, shipbuilders, engineers and contractors. Write William Kane, c/o MANUFACTURERS RECORD, Baltimore 3, Md.

Want a line of steel products for the State of Indiana and Kentucky. Have been in steel business 18 years in mill and sales departments. Have technical education, training in metallurgy, alloys and stainless steels. Am well known in this territory among all buyers of steel products. Address H. Child Jones, c/o MANUFACTURERS RECORD, Baltimore 3, Md.

Want to represent manufacturers of Hot Rolled Steels, Cold Rolled or Cold Finished Steels, Seamless Steel Tubing, Copper and Brass Tubing, bars and sheets, and similar metal lines in Florida, Georgia, Alabama, Mississippi and Louisiana. Established for ten years, keeping personal contact with the trade. Do not anticipate being drafted. Charles W. Bringman, c/o Manufacturers Record, Baltimore-3, Maryland.

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